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INDIVIDUAL DIAGNOSIS IN WRITTEN COMPOSITION

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How shall a teacher of beginning high-school English find out economically, comprehensively, and accurately what instruction and training each of his pupils needs in the formal elements of written composition?

Certain data which I have collected while investigating methods of teaching the mechanics of written English seem to me to have sufficient bearing on this problem to warrant presentation and comment. During the first and second weeks of October, 1924, three English tests were given to eight beginning ninth-grade classes, four experimental and four control, in a large public high school near New York City. The tests called for an original composition on an exciting experience, a reproduction of an anecdote, and the correction of a long theme containing some 180 formal errors of 85 different kinds. The same tests were repeated eight weeks later during the first two weeks of December. Testing conditions and procedures were as nearly identical as possible for the pairs of tests.

The original composition and the reproduction were examined carefully and systematically for mistakes in spelling, capitalization, punctuation, grammar, sentence structure, and diction, with the aid of a rather elaborate key or guide. The correction-of-error test was checked for errors missed and for extra errors introduced by the pupil. The compositions were scored for number of words written, number of errors per hundred words, and number of different kinds of errors per hundred words. The

correction-of-error test was scored for the total number of errors left uncorrected plus all extras, and for the number of different kinds of errors. In this article the only data used are those gathered from the sixty-six pupils in the control classes who took all six tests. The distributions of their total error scores appear in Tables I and II with spelling omitted from the first two sets, since it was not a feature of the proofreading test.

TABLE I. SCORES OF SIXTY-SIX CONTROL PUPILS ON THE FOUR COMPOSITION TESTS

Errors* per 100 Words	Original		Reproduction	
	October	December	October	December
(1)	(2)	(3)	(4)	(5)
18–	1	1	1	3
16–17	1	0	4	1
14–15	0	3	4	1
12–13	5	3	6	8
10–11	10	12	5	11
8– 9	10	12	17	14
6– 7	20	13	15	14
4– 5	16	17	12	7
2– 3	3	5	2	7
0– 1	0	0	0	0
Total	66	66	66	66
Median	7.4	7.7	8.5	8.7
Mean Deviation	2.5	2.9	3.0	3.0

* The median lengths of the original compositions were 231 and 202 words, and of the reproductions 185 and 190 words, for October and December, respectively.

This group of sixty-six pupils was fairly representative in age and intelligence range of the whole grade, of which it was about an eighth part when the tests were given. Its median age was slightly less than that of the grade, and its median intelligence, according to Dearborn Group scores, was slightly higher. Presumably, then, its scores in these English tests are somewhat better than those of the whole grade would have been, but the range indicates rather closely the spread of ability throughout. The mean deviations are about the same in the four composition tests, and also in the two correction-of-error tests; but they are ap-

parently less in the latter than in the former when reduced to equivalent bases.

The aspect of these tests here considered is their relative value in revealing individual weaknesses in composition formals. In the first place, how economical are they? Can the average high-school teacher meet their cost in time, effort, and money? The tests take equally long to give—thirty minutes. The com-

TABLE II. SCORES OF SIXTY-SIX CONTROL PUPILS ON THE TWO CORRECTION-OF-ERROR TESTS

Errors* Missed Plus Extras	Testing	
	October	December
(1)	(2)	(3)
150–	0	0
135–129	5	4
120–134	6	7
105–119	11	12
90–104	18	18
75– 89	14	10
60– 74	10	12
45– 59	1	2
30– 44	1	1
15– 29	0	0
Total	66	66
Median	96	97
Mean Deviation	18.5	19.5

* The correction-of-error test contained 650 words, in which were "planted" 180 errors of 85 different kinds.

position tests take the same time per unit of length to read, check, and tabulate diagnostically—about fifteen minutes a paper in this investigation. The correction-of-error test takes twenty-five minutes to check, analyze, and tabulate. The effort spent in scoring the tests was not measured, of course; but it should be clear that checking the errors in compositions requires a much more intense study than marking a correction-of-error test. On the other hand, the compositions cost little or nothing in materials, while the correction-of-error test necessitates mimeographed or printed sheets, scoring keys or stencils, and recording blanks.

The cost of these latter materials, however, is not such as to discourage the use of the test if it were shown to have real value.

The economy of the tests has to do chiefly with the time cost. When this is summated for a pupil load of 125 to 175, it seems high for all these tests. Assuming that a teacher while performing his regular duties could also put in two hours a day on test papers, it would take him from 15 to 22 days for one of the composition tests and from 25 to 35 days for the correction-of-error test. That is rather too slow for practical diagnosis. In the case of the correction-of-error test, this excessive expenditure of teacher time and labor can be obviated by having the pupils check and tabulate their own papers under direction. Not only is such a plan feasible, but it also may be made to yield learning results that fully compensate for the time spent. Altogether then, with respect to economy the proofreading or correction-of-error test is much to be preferred to the composition tests.

How comprehensive are these tests? How deeply and widely do they measure the individual's mastery of such things as punctuation, grammar, and sentence structure? Are the data derived from them enough to show what special practice or instruction each pupil needs? No final or wholly satisfactory judgment of the relative inclusiveness of these tests can be reached except through an accurate count and definite identification not only of the actual errors made but also of the opportunities for error, for it is the ratios of the first to the second that are significant for comparisons. But counting and identifying the opportunities for error in such tests is impossible except in a limited degree. The best that one can do is to make inferences from the number of errors that can be checked, assuming that the relation between opportunity and error is fairly constant, and that the more kinds of errors there are, the more comprehensive the test must be. This is begging, for the time, the whole question of whether making an error in a composition is at all the same thing as leaving an error uncorrected in a proofreading test.

At this point, at least three of the ten thousand embarrassing questions that the composition investigator is likely to meet insist on recognition. What is an error in composition? What is a kind of error? How are errors to be checked and classified? The only answers that I can give now, and for this study, are these: An error in composition is any violation of what I, on the basis of my experience, a study of English usage in standard manuals, and a review of other error counts, conceive to be

TABLE III. DISTRIBUTION OF DIFFERENT KINDS OF ERRORS MADE ON THE FOUR COMPOSITION TESTS

Kinds of Error per Paper	Original		Reproduction	
	October	December	October	December
(1)	(2)	(3)	(4)	(5)
24–	1	0	1	1
22–23	3	0	1	1
20–21	2	2	2	1
18–19	7	3	3	3
16–17	2	8	9	8
14–15	6	4	4	9
12–13	9	15	14	13
10–11	14	7	13	14
8– 9	10	10	7	7
6– 7	7	8	9	4
4– 5	5	8	3	5
2– 3	0	1	1	0
Total	66	66	66	66
Median	11.6	11.7	12.1	12.5

approved usage in spelling, capitalization and punctuation, grammar, sentence structure, and diction. A kind of error is merely an error explicitly named on the guide which I follow,—a guide naming some two hundred fifty kinds of errors classified under the broad heads just stated and as detailed as I can trust myself to use consistently. Errors are checked in the compositions with only such accuracy and completeness as my own ability makes possible during careful reading, and these errors are named according to my interpretation of my own error guide. In the case of the correction-of-error test, checking and identifying are simplified and made objective by the use of keys and

stencils. For the most part this whole matter of error-finding and error-naming is merely a systematized application of subjective ability. In so far, though, as it represents what the classroom teacher would be expected to do in diagnosing pupils' compositional weaknesses, it is justifiable.

In returning to the matter of the relative comprehensiveness of the three tests for showing individual needs in composition, it is first pertinent to refer to the number of kinds of errors checked on each test. Tables III and IV give the distributions of

TABLE IV. DISTRIBUTION OF DIFFERENT KINDS OF ERRORS MADE ON TWO CORRECTION-OF-ERROR TESTS

Kinds of Error	Testing	
	October	December
(1)	(2)	(3)
85–	0	0
80–84	1	0
75–79	7	5
70–74	6	5
65–69	5	13
60–64	10	7
55–59	21	16
50–54	11	8
45–49	1	7
40–44	3	2
35–39	0	2
–34	1	1
Total	66	66
Median	59	59

scores for the different kinds of errors in each of the six testings. In both the original and the reproductive compositions there appear, on the average, only ten or twelve different kinds of errors per paper. The correction-of-error test shows a median of 59 different kinds of errors either left uncorrected or introduced. Since the 85 kinds of errors incorporated in this test are of the commonest sorts and exactly like those made by pupils of the age here studied, it is possible to say that if mastery of the

formal essentials functions in proofreading as it does in composing, then this correction-of-error test provides a much more complete list of an individual's weaknesses than does either of the composition tests. Programs of individual instruction based on findings from single compositions would be much less elaborate than those based on proofreading tests of the kind described.

TABLE V. NEW KINDS OF ERRORS MADE FROM TEST TO TEST BY TWELVE UNSELECTED PUPILS

Pupil	Compositions					Correction-of-Error		
	Original		Reproduction		All	Number of Words	October	December
	October	December	October	December				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
5	20	8	6	7	41	881	72	9
10	14	8	10	6	38	861	56	8
15	8	7	5	7	27	792	57	7
20	12	9	4	4	29	751	59	8
25	13	5	12	4	34	891	71	6
30	12	5	7	5	29	931	50	9
35	11	9	8	6	34	833	55	5
40	31	7	5	7	50	851	75	8
45	22	8	4	6	40	873	67	11
50	19	10	17	6	52	701	77	5
55	4	4	13	2	23	897	56	12
60	9	2	7	4	22	817	58	11
65	19	5	13	4	41	782	76	5
Mean	15	7	9	5	35	835	64	8

The limitations of the single theme in giving anything like a full account of a pupil's exact needs are still further shown by an examination of the new kinds of errors made in successive tests. In Table V are given the records of twelve unselected pupils summarizing the new kinds of errors made in the four composition tests considered successively and in the two trials of the correction-of-error test.

From this table it appears that pupil 5 made 20 kinds of errors in the *October original*, 8 new kinds in the *December original*, 6 more new kinds in the *October reproduction*, and still 7 more

new kinds in the *December reproduction*. He made 72 different kinds in the *October correction-of-error* and 9 new kinds in that of *December*.

The column averages in Table V show 15 different kinds of errors in the first original composition, 7 new kinds in the second, 9 more new kinds in the first reproduction, and 5 more new kinds in the second. The corresponding averages for the correction-of-error test are 64 and 8. All this goes to prove that a single theme does not begin to exhaust a pupil's capacity for making different kinds of errors, but that the correction-of-error test develops little on a second trial which it does not bring out on the first. A reasonable conclusion seems to be that on the score of comprehensiveness the proofreading test is decidedly better than either of the composition tests.

There is a third question to be answered which is much more important in its bearing on the values of these tests as individual diagnostic instruments than those already considered. What is the relative accuracy of the tests? What are their validities and their reliabilities? The determination of validity requires a definition of what is meant by mastery of the formal elements and the setting up of a reliable criterion with which to compare tests. It might be acceptable to define mastery in this instance as the ability to write without error what one needs to write. Then it might be further acceptable to take as a criterion for judging tests of mastery, enough of an individual's school and voluntary composition to give reliable error scores—a self-correlation of 0.90 or better—and to afford a comprehensive display of strengths and weaknesses. Such a criterion is not available for this group of sixty-six pupils. Something might be made out of a composite of the four themes, but I am not yet ready to report the attempt.

As to the reliability of these tests, the consistency with which they measure whatever they do measure, more can be reported. Table VI gives the correlations between the tests in each pair for total errors and for different kinds of errors with respect to

errors of (1) *All types,* (2) *Capitalization and punctuation,* and (3) *Grammar, sentence structure, and diction.*

In the first four correlations of the original composition scores only sixty-four of the pupils are included. The performances of two were so erratic and so patently influenced by accidental factors, particularly with reference to their use of punctuation, that their scores were cast out in these correlations. With their scores included the correlations would be respectively 0.48, 0.51, 0.13, and 0.13.

TABLE VI. CORRELATIONS (PEARSON'S r) BETWEEN THE OCTOBER AND THE DECEMBER SCORES IN EACH OF THE TESTS

Errors	Original Composition		Reproduction Composition		Correction-of-Error Test	
	r	P. E. ±	r	P. E. ±	r	P. E. ±
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All Types					
Total	.57	.05	.75	.03	.92	.01
Kinds	.55	.06	.63	.05	.97	.01
	Capitalization, Punctuation					
Total	.35	.07	.56	.05	.87	.02
Kinds	.34	.07	.41	.07	.73	.04
	Grammar, Sentence Structure, Diction					
Total	.56	.06	.63	.05	.81	.03
Kinds	.57	.06	.62	.05	.85	.02

Strictly speaking, the correlations in Table VI cannot be called reliability coefficients because of the time between tests and, in the case of the reproduction and the correction-of-error test, the use of the same forms. Changes in the formal habits, however, do not take place rapidly at the high-school level. Furthermore, in the classes studied, little of the English work during the eight weeks was in composition. Other investigations which I have made with smaller groups to whom I have given different forms of the reproduction test on successive days have developed self-correlations in close agreement with these reported here. As for the proofreading test, the two factors, lapse of

time and identity of form, are probably compensatory in effect. In view of these considerations, I am regarding the correlations of Table VI as practically the equivalents of reliability coefficients.

The correlations of the original-composition test are the lowest, those for the reproduction next, and those for the correction-of-error test the highest. These last alone are high enough to suggest a practical reliability for individual diagnosis. By using the formula

$$n = \frac{r_n\ (1 - r_{12})}{r_{12}\ (1 - r_n)},$$

the extensions necessary for the original and the reproductive compositions to yield self-correlations of 0.90 are found to be nine and one-half and four times respectively.

Since the problem is to obtain tests upon whose results individual instruction can be based, it is not enough to know how well their crude, lumped scores correlate; the identity of kinds of errors in successive tests needs to be determined. It is easily conceivable that a pupil's total error scores may agree closely from test to test, and yet that he may be making a different set of mistakes each time. A rough measure of the identity of error from test to test may be obtained by computing the ratio of the kinds of errors found in both tests to the total different kinds in each. Table VII gives such ratios.

Only a third of the kinds of errors made in one of the composition tests appears in the second like composition; while nearly seven-eighths of those made in one trial of the correction-of-error test appear in a second trial. In reliability, therefore, both gross and specific, the correction-of-error test is greatly superior to the composition tests.

So far as economy, comprehensiveness, and reliability are concerned, the correction-of-error test used in this study is a far better instrument for revealing individual weaknesses in proofreading than is a single original or reproductive composition for revealing weaknesses in the formal elements of composition. What relation exists between weaknesses in proofreading and

weaknesses in composing remains to be discovered. Tentative manipulations of the data which I have obtained from both the experimental and the control classes mentioned at the opening of this article seem to indicate the presence of a substantial correlation between the ability to write accurately and the ability to correct errors, enough perhaps to justify using systematically prepared, comprehensive proofreading tests for individual diagnosis and the planning of individual instruction. At any rate, the evidence against counting errors in compositions for this purpose is considerable.

TABLE VII. RELATIONSHIP OF ERRORS MADE IN BOTH THE OCTOBER AND THE DECEMBER TRIALS OF EACH TEST TO THE TOTAL KINDS OF ERRORS MADE IN EACH TRIAL

	Original Composition	Reproductive Composition	Correction of Error
(1)	(2)	(3)	(4)
Median of errors common to both trials	4	4.3	49.7
Median of different errors in October	11.6	12.1	59.0
Median of different errors in December	11.7	12.5	59.0
Ratio of common to October different	.34	.35	.84
Ratio of common to December different	.34	.34	.84

The Tests

The original composition was secured according to the directions that accompany the Willing Composition Scale.[1]

Pupils were given a slip of paper with the following brief outline for the reproduction composition:

NAPIER AND THE JUGGLER

Just after successful close of British campaign in India—General Napier and others entertained by a juggler—The best act—Napier's suspicion and his way of finding out the truth—The juggler's refusal and Napier's satisfaction—The juggler's response—Napier's surprise—The act repeated—How it felt.

[1] Willing, Matthew. "The Measurement of Written Composition in Grades IV to VIII," *English Journal*, 7:193-202, March, 1918.

Directions

On the slip of paper which has been given to each of you there is a short outline of an incident that happened a good many years ago in the life of General Napier, a British commander in India. From this outline and from a more complete one which I shall read presently, you are to write the best story you can without the chance of revising or rewriting it later. Listen closely while I read the longer outline or series of notes which I have here. I will read it through twice before asking you to write.

In India with the British army after the close of a successful campaign—General Napier seated one day before his tent with some friends, his staff, and his family—Entertainment provided by a native juggler and his assistant—Many surprising feats; but the principal one, the cutting in two, with a sword, of a lemon placed in the assistant's hand—Napier's suspicion of mere trickery because of the seeming impossibility of the feat—His offer to hold the lemon in his own right hand—The juggler's refusal without giving reason—Napier's satisfaction at thus seeming to prove his suspicion true—The juggler's sudden request to see Napier's left hand—His immediate agreement to perform the feat on that hand—Napier's question as to the reason for the change of mind—The juggler's explanation that the center of Napier's right hand was so low that his thumb might get cut off, while the center of the left was low—Napier forced to conclude that this was clever swordsmanship, not trickery—No escape from the test—the juggler's repetition of his performance without scratching Napier's hand—Napier's subsequent statement of feeling what seemed like a cold thread drawn across his palm.

Now you may write, using both sides of the paper if you wish. Work all by yourselves without reference to anything but your outline. Be careful not to make too long a story. Corrections and changes will have to be made between lines as you go along, for there will be no time to revise later. Be sure to include conversation in your story; that is, make the characters talk. Write.

Pupils were allowed twenty minutes for the writing. They were required to count the words they had written and record the total on their papers before handing them in.

The correction-of-error test was given to the pupils in mimeographed form. They were allowed to work on it for about fifteen minutes on each of two days. The test and the directions to the pupils follow:

Directions.—In the following theme there are errors in capitalization, punctuation, grammar, sentence structure; and word usage. Correct as many of these errors as you can, writing between lines and being careful to make no unnecessary changes and to leave out no ideas now present.

JOHNS HAPPY DAY

John was staying to home. When he might of went fishing. He set in his room sulking. His dog roamer laid on the floor besides him. Waiting for something to happen. The trouble was john was jealous of his sisters elizabeth ann and mary ellen for the reason they received new ribbons hats and shoes that morning and he didn't get nothing. Of course he did not want those kind of presents but it seemed like the girls was always getting more things than him. His birthday to be sure had only been a week before and he had been give many presents and he had ought to have been satisfied. But a person soon forgets their own good luck if they keep all the time looking at somebodys elses whomever they are.

While going over his troubles to hisself Elizabeth Ann suddenly appeared in the doorway and called to him gaily i say john come down and play tea party with mary ellen and I.

John without looking up growled whatre you goin to have to eat.

Crackers and water'' said his sister not so sweet as before ''and imagine there cakes and cocoa. Wont you come remember we played pirate with you yesterday

But John said gruffly that he hated tea parties and wanted to read treasure island. Then to he had a toothache and shouldnt eat nohow so he couldnt except there invite

As his sister slammed the door and run downstairs John thought he had did pretty good so he most forget to sulk for a few minutes Even he winked at roamer whom he felt understood the joke as well as him the dog winked back.

Soon he begun to hear sounds of his sisters party, it come from right under his window. Which overlooked a little summer garden. The clatter of dishes and the young ladies society talk was clearly to be heard. To his surprise he found this interesting. In spite of him having said he hated tea parties.

Every now and then he looked toward the window, due to his rising curiosity which threatened at any moment to get the better of him. Finally he got up. He walked over to the window. He looked out. He saw the girls. Each of them were seated on little chairs at a low table. But they were not eating dry tasteless soda crackers nor sipping cold water, on the table there was steaming cocoa pink-iced cakes and pappermints. These made his mouth water.

John now felt very sorry for his speech to Elizabeth Ann so he wondered how he could get in on the tea party yet so he decided to go down and give the girls another chance to invite him. At once he left the room to make the try together with his dog. In a minute or two he and roamer was in the little garden strolling up and down carelessly and whistling. To make it seem he didnt care about the party. But the attention of the girls weren't drawn his way. Neither of them were aware so it seemed at least of his presence. After he had finally walked by them four times Elizabeth Ann looked up and seen him. Oh she said are you here John. Isnt it to bad you have a toothache and cant eat weve never had a more lovelier tea party.

At that John nearly bursted with anger but he went on whistling to the street through the gate without saying nothing but he keep telling himself that he would be much carefuller another time where he located his excuse pains. It had certainly been wrongly placed this time. It is clear to see that John was not all together different than other boys who we know.

EQUALIZATION OF EDUCATIONAL OPPORTUNITY

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The Educational Finance Inquiry has doubtless made an outstanding contribution[1] in bringing to attention the incompatibility of the two aims commonly used in formulating systems of state aid. The fact that state funds cannot be used satisfactorily both to equalize educational opportunity and to encourage progress in individual communities by rewarding effort demands a re-examination of all state-aid systems in the light of a new array of guiding principles.

There can be no question as to which of these two aims will survive. Equalization of educational opportunity—a minimum satisfactory offering with the burden falling equally on all parts of the state—has come to be accepted as a fundamental principle of our democracy, and it cannot exist without state aid. The right and duty of the state to encourage progress beyond the minimum are also recognized, but state aid is not a fundamental concomitant of this. Reward for effort is simply one administrative method for encouraging progress. It cannot claim recognition comparable to payment for equalizing educational opportunity. Reward for effort would, therefore, seem to be destined to play a continuously smaller part as a use for state funds. Other means will be developed for encouraging progress.

Obviously this simplifies the task of formulating or testing a system of state aid. He who would formulate or test a system of state aid must ask first whether it will equalize educational opportunity. He must then scrutinize every proposal that has some other purpose for its aim to determine how it affects the equalization of educational opportunity. Finally, when the plan is complete, he should be able to tell exactly where and in what degree this principle has been violated.

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[1] Strayer, G. D., and Haig, R. M. *The Financing of Education in the State of New York*. New York, Macmillan Company, 1923. p. 174. (Educational Finance Inquiry, Vol. I)

The writer is interested particularly in indicating some of the techniques that this simplification of attack makes possible. Two rather extended pieces of work have been done as a result of the encouragement this simplification in aim has given to the study of the implications of the principle of equalization of educational opportunity. One of these, *The Measurement of Educational Need*,[2] will be touched upon briefly as it is involved in the other, *A Report on State Aid to Public Schools in New York State*.[3]

This article, a digest of the second report, presents some of the straightforward methods of attack for particular problems which were revealed while developing a system of state aid based upon the principle of the equalization of educational opportunity. The tables, graphs, and other parts of the text not necessary to the understanding of the technique are omitted.

The report to the Joint Legislative Committee presented first the general principles discussed above. It attacked the problem of measuring the tasks faced by communities in offering equivalent educational opportunity, deduced a statement of what constituted a financial measure of an acceptable minimum educational offering in the state of New York, analyzed the present system of state aid, and then, in the light of the statement of aims demanded by the principles involved and by the conditions in the state, set up the financial system indicated. The report also outlined the method of determining the degree of inequality introduced by any proposal to use state aid for other purposes.

Measuring the Educational Task

For the purpose of determining the educational task of the community the weighted-pupil measure was adopted. This measure had been developed in the study, *The Measurement of Educational Need*, previously referred to, and New York had

[2] Mort, Paul R. *The Measurement of Educational Need.* New York, Teachers College, Columbia University, 1924. 84 pp. (Teachers College, Columbia University, Contributions to Education, No. 150)

[3] *A Report on State Aid to Public Schools in New York State.* Prepared for the Joint Legislative Committee on Taxation and Retrenchment by Paul R. Mort with the cooperation and advice of George D. Strayer, J. R. McGaughy, and Robert M. Haig. Report of the Special Joint Committee on Taxation and Retrenchment, J. B. Lyon, Albany, 1925.

been chosen to illustrate the technique. The new measure, the weighted pupil, was used rather than the number of teachers, the number of pupils, the number of legal teachers, or the actual expenditure for education, although each of these measures is now used in one or more states. Taking the offering demanded by a given program for a city elementary child as a unit, this device weights a pupil when measuring the need in any other situation or in any type of education recognized on the minimum program by an amount representing the relative cost of giving the pupil what would reasonably be accepted as an equivalent offering. For instance, a city high-school child is given a weighting of two; that is, a city high-school child counts two weighted pupils.

The Permissible Minimum Program

Considering both the educational task and the financial ability of the state, a measure of the type of educational offering the citizens, of New York, are willing to support, may be obtained by discovering the kind of opportunity made available in those communities which have practically the same ability to support schools as has the state as a whole. From a study of the current expenses in twenty-three cities, villages, and supervisory districts, having not more than 15 percent greater or less valuation of real estate[4] per weighted pupil than has the state as a whole, the median was found to be $70 per weighted pupil.

The assumption is that the tendency for the people of New York living in cities, villages, and rural communities, when faced by the same financial and educational situation which the state as a whole faces, is to meet the situation by offering a $70 education. That is, they spend enough to buy for the children in their elementary schools the kinds of offerings that $70 will buy for a city elementary pupil and $140 will buy for the pupil of a city high school. An interesting comment on actual conditions is the fact that in the state of New York in the year 1922-23,

[4] The financial ability of a locality at any given time must be measured in terms of the paying ability under the tax system that the state has placed upon it. Since the bulk of local taxes in New York State is raised from real estate, this is the best measure of the ability of communities as they now exist.

the year upon which these findings are based, but half of the cities and large villages—communities having over forty-five hundred inhabitants—attained or exceeded this level. Only a small percent of the country schools spent enough to buy this type of education.

Effectiveness of Present State Aid

The situation reviewed in the last paragraph indicates that the state has failed to meet its responsibilities of requiring a satisfactory minimum program. But the state fails also to equalize the burden of even the meager minimum program which it permits to be offered. To purchase a $40 education certain communities would have to levy four times the local tax which would be required if the burden of a $40 education were equalized. To offer a $70 education at least one community would have to levy a local tax fourteen times as great as would be required if the burden of a $70 education were equalized.

The reasons for the lack of effectiveness of the approximately thirty-nine million dollars of state aid now distributed to local communities may be readily demonstrated. They may be summarized briefly as the distribution of a small-aid fund by the large-fund method of distributing aid, and an inadequate measure of the educational task faced by communities.

An equitable distribution of burden may be obtained in either of two ways, by complete state support of the minimum program or by a uniform offering in each community. The former method obviously requires the greater state fund. The former method, or large-fund method, requires a fund large enough completely to support the minimum program. This method of support demands that the funds be distributed according to the educational task faced by communities without regard to ability to pay. Equality of burden is obtained by the method of collecting the tax. The latter, or small-fund method, requires that funds be distributed so that poor communities receive more than wealthy communities.

Now, if a state has a fund that is small compared to the total cost of the minimum program and attempts to distribute funds by the large-fund method, that is, without regard to the wealth of the communities, it will fail to equalize the burden of a minimum program. This is one of the shortcomings of the New York system. The wealthy community and the poor community, by and large, share alike. There is no tendency to pay the poor community more than the wealthy. Only when the state fund is large enough completely to support the minimum program will this method result in the distribution of burden according to ability to pay.

The second reason why the present system fails to equalize a satisfactory education is that the combined funds for all of the various purposes[5] paid to communities are not proportional to the needs of the communities.

If the thirty-nine million dollars were distributed strictly according to the large-fund method, the same amount per weighted pupil would go to each community in the state. Since there are 1,922,232 weighted pupils in the state, there would be approximately $20 for each. As a matter of fact, however, some communities receive considerably more than this and some considerably less. The range in 1922-23 was from $11.50 to $30.50.

Proposed Plan of State Aid

I. Desired results from a proposed plan.—Analysis shows that improvement of the present system must come through a change in the method of measuring the need of communities for aid and from a consideration of the wealth of communities in the distributing of funds.

In developing the proposed plan of state aid for New York State, the following ends were sought: (1) A $70 education—an annual current expenditure of $70 per weighted pupil—should

[5] The present system of state aid is really a combination of the various aids that have accumulated over the last century. It is not, in reality, a system but rather many systems. For an extended description of the various aids, see Strayer, G. D., and Haig, R. M., *The Financing of Education in the State of New York* (New York, Macmillan Company, 1923).

be provided throughout the state. (2) The burden of this $70 education should be distributed so as to bear upon the people in all localities at the same rate in relation to their tax-paying ability. (3) No community should receive less state aid than it now receives. (4) Of the total amount paid as state aid the maximum amount possible should go toward the equalization of educational opportunity. (5) The plan should demand as small an amount of state aid and, therefore, as large a degree of local support as is feasible.

Although the third condition is not required in order to bring about the equalization of a satisfactory educational opportunity, the present situation in financing education in the state, especially in the large cities, makes this provision imperative. Cities limited in their taxing power by the state constitution would be sorely handicapped by a decrease in state aid. The fifth condition is likewise not essential to the equalization of educational opportunity, for the large-fund method of equalization could be used and all of the other conditions met perfectly; nor does it jeopardize the equalization of educational opportunity.

II. Summary of the proposed plan.—The aforementioned conditions are met most advantageously by the following provisions: (1) a local tax rate[6] of 36.4 cents per $100 full valuation of real estate; (2) the increase of the state education fund (1922-23 basis) from approximately $39,000,000 to approximately $62,500,000; (3) to those communities having less than $70 per weighted pupil available from the present state aid combined with returns from the uniform local tax of 36.4 cents per $100 the payment of additional state aid so that $70 per weighted pupil will be available. These provisions arise from the most advantageous combination of the large- and small-fund methods of equalizing so as to meet the five conditions listed.

III. The small-fund part of the plan: results when present state aid is unmodified.—Since no community now receives less

[6] Here and elsewhere in this paper the term "local tax rate" refers to the local rate of contribution to the support of the uniform minimum program. The actual local tax rate for schools, either assumed by the community or required by the state, may be higher.

than $11.50 state paid per weighted pupil, we may consider the present plan as supporting an $11.50 education. All aid beyond $11.50 goes for purposes other than guaranteeing an equal offering, for beyond $11.50 some communities receive nothing. Since $11.50 per weighted pupil is already paid by the state, and, therefore, equalized by the large-fund method, the equalization of a $70 education would require the equalization of $70 — $11.50 or $58.50 per weighted pupil.

The most advantageous use of the small-fund method in equalizing this $58.50 education would, as will be clear from later discussion, give the wealthiest community nothing more than it now receives from the state. It would require the community to support the additional $58.50 education entirely by local effort. The required tax rate in this wealthiest community would then be made the local uniform tax rate for supporting the additional $58.50 education. No poorer community would raise sufficient funds from the uniform tax to pay for the additional $58.50 per weighted pupil. The poorer the community, the further short it would fall of the $58.50 per weighted pupil; the state would then pay the deficit.

Obviously, as the uniform local rate assessed on all localities increases, the amount raised locally increases and the state aid correspondingly decreases. There is a limit, however, beyond which it may not be raised. If the rate is raised above the point necessary to support a $58.50 education in the wealthiest district, that district is at once relieved of the necessity of levying a tax as high as the other localities to support the minimum program. Such a community is not paying its share. It gets off easily, and the burden of paying the amount it saves is thrown on the state as a whole.

There are thus two factors opposing each other in determining the local uniform tax rate. In attacking the problem of deciding between these issues, it will simplify matters if the relationship between the local uniform rate and the percent of the cost of a given program which must be carried by the state can be determined. The proportion carried locally will be the uni-

form local rate divided by the rate that would be necessary as a state-wide rate if there were no local support and if the state support were derived from the real-estate tax. This quotient subtracted from 100 gives the proportion carried by the state. This procedure may be simplified into the following:

$$\text{Percent of total cost of program to be provided from state funds} = 100 - \frac{\text{Per-weighted-pupil valuation in the state as a whole}}{\text{Per-weighted-pupil valuation in the community the required tax rate of which is to be used as the uniform local rate}}$$[7]

Knowing the per-weighted-pupil valuation of the real estate of the state to be $10,419, it is easy to discover what state funds would be necessary to finance a $58.50 education, using various local tax rates. The wealthiest city, village, or supervisory district[8] is Long Beach with a valuation per weighted pupil of $71,159.

If complete equalization of burden is to be secured, the rate necessary in Long Beach to raise $58.50 per weighted pupil must be determined. If this is done, the state fund will be required to provide:

$$100 - \frac{10{,}419}{71{,}159}$$

or 85 percent of the total cost. Since the cost of a $58.50 program is $1{,}922{,}232 \times \$58.50$, or $112,450,572, the state fund necessary to finance a $58.50 education with the Long Beach local rate is 85 percent of $112,450,572 or $95,583,000.

Now note the difference if the rate of New York City—the richest county—is used. New York City has a valuation per weighted pupil of $13,461. Substituting this in the formula, it

[7] Strictly, this applies only when the richest district is used. It is, however, accurate within 2 or 3 percent so long as there is not more than 5 percent of the property of the state in richer communities than the one used.

[8] The richest individual school district that was located has $86,000 per weighted pupil.

appears that with the New York City rate as the uniform local rate, the state fund would provide only

$$100 - \frac{10,419}{13,461}$$

or 22.6 percent of the total cost,[9] $112,450,572, which is $24,413,761.[10]

The state-aid fund necessary with the Long Beach rate is almost four times as great as that requisite for the New York City rate. Certainly, if a small-state fund is desirable, the New York City standard is much better. But how much violence does this do the principle of equalization of burden?

Sixteen small villages, cities, or supervisory districts would gain if the New York City rate were used. Long Beach, the most favored community, would be able to meet the $58.50 education requirements, state and local taxes, with but 37 percent of the effort of the state in general. Five others would be required to put forth less than 75 percent as great effort. These communities, however, represent only 4.2 percent of the property of the state. Although in the neighborhood of $744,000 is lost in taxes,[11] this loss increases the burden of the state in general about .5 percent.[12] The disadvantage in having these few communities undertaxed is not supported by a significant increase in the state burden. It would seem, therefore, that the advantage in the smaller fund coming from the use of the New York City rate would be so great as to offset these slight variations from the principle of equalization of burden.

To raise the local uniform rate any higher would bring about the undertaxing of the vast amount of property in New York

[9] Actually, slightly more than this, due to some rich communities getting off at less than the local uniform rate.

[10] The amount the wealthiest community would avoid paying would be added to this. In this case, as explained later, this additional amount would be $744,000.

[11] If the local rate were that of Long Beach, these 16 communities would pay $744,000 locally and into the state fund which would go toward the total cost of the program. Since with the higher rate, it is not necessary for them to pay this amount, the result is an increase of the burden on the state as a whole by this amount.

[12] $744,000 divided by the total cost of the program, $134,500,000, is .55 of one percent.

City and thus materially affect the burden. To choose a rate between the Long Beach and New York City rates would increase the state fund rapidly over that required by the New York City rate with little difference in the inequality of burden.

IV. The large-fund part of the plan.—The foregoing proposal does not allow for any changes in the present system of state aid. It analyzes the present system in such a way as to determine the amount of equalization it brings about. This is approximately $11.50 per weighted pupil. Since there are 1,922,232 weighted pupils in the state, 1,922,232 × $11.50 or $22,000,000 of the $39,000,000 now distributed by the state goes toward the equalization of educational opportunity on the large-fund basis. The remaining $17,000,000 goes toward the support of a richer education in certain communities in the state.

The state supports at least a $15 education in nearly all communities. If the state were to pay the few communities that receive less than $15 enough to make $15, it would be possible to think of the present system as equalizing a $15 education. There are so few communities receiving less than $15 per weighted pupil that it would require only about $30,000 additional to bring the minimum amount received in the state up to $15. With the expenditure of this small additional amount the effect upon the equalizing power of the present state fund would be great. Instead of 1,922,232 × $11.50, or $22,000,000, being used for equalization of educational opportunity, 1,922,232 × $15, or $29,000,000, would become available for this purpose. That is, the expenditure of $30,000 would cause almost $7,000,000 more of the $39,000,000 now being spent to be available for the equalization of educational opportunity. Similarly, if all communities now receiving less than $20 per weighted pupil were paid enough to bring them up to $20, then 1,922,232 × $20 or $38,000,000 would go toward equalization, but an addition to the state fund of $1,500,000 would be required to make the extra payments. In other words, in the neighborhood of thirty-seven—$38,440,000 minus $1,500,000—of the present thirty-nine million dollars of state aid would go to the equalization of educational opportunity.

This would be an increase of $15,000,000 over the amount now available and would be made possible by the expenditure of only an additional million and a half dollars. Looked at from the other side, it would permit only two millions, instead of seventeen millions, to go to aid some communities more than others which are equally needy.

If the present plan were revised to include this additional million and a half of state aid and to raise the minimum under the present aid system from $11.50 to $20.00, certain other changes would be possible. Since with this change $20 rather than $11.50 would be already equalized only an additional $50.00 instead of $58.50 would be required to make a $70 offering in every community. Both the state fund required and the local tax rate would therefore be decreased approximately one-sixth—$58.50 less $50, divided by $58.50. This is a decrease in the state fund of approximately $4,000,000. This amount of state fund offsets the million and a half necessary to raise all communities to $20 and so results in a net decrease of two and a half millions in the state fund. There is nothing to offset the decrease of one-sixth in local tax rate. This whole advantage from raising the minimum of the present plan of state aid from $11.50 to $20 may be expressed as an advantage of more than 10 percent in the burden that would be required to support a $70 education, when state and local taxes are both considered. The cause of this advantage is the fact that making the net minimum received $20 makes available for the support of the minimum program an additional $15,000,000 of the present state fund that now goes to aid some communities more than others.

The above discussion brings out all the principles involved in modifying the present system of state aid so that more of the present state aid will become available to support the minimum program. A more detailed analysis, noting the results as the minimum is increased dollar by dollar, shows that there is a certain most advantageous point—$21 per weighted pupil—to which the minimum should be raised, to meet best the condition of maximum feasible equalization of burden and minimum feasible

state aid. The total additional state fund necessary to bring all communities up to $21 per weighted pupil is $2,300,000.

The $49 additional necessary to make a $70 offering would cost the state fund 1,922,232 × $49 × 22.6 percent or approximately $21,300,000 since, when the small-fund method is used with the New York City rate, 22.6 percent of the total cost must be paid by the state. To this would be added about $600,000, which communities richer than New York City fail to pay locally, and hence must come from the state fund. The total addition to the state fund would be $24,200,000.

V. Use of large-fund excesses to pay small-fund deficits.— Of the $63,300,000 state aid required in the above summary, but $1,030,000 does not go to the equalization of opportunity compared with $17,000,000 out of the present $39,000,000. This $1,030,000 is made up of the excesses over $21 per weighted pupil paid under the present plan. By offsetting some of these excesses by the deficits under the $49 part of the program, $800,000 of this $1,030,000 may be used for equalization, leaving but $230,000 ineffective toward equalization of educational opportunity.

The administration may be simplified and at the same time the state fund may be decreased by approximately $80,000. This may be done by further limiting the amount allotted to communities which now receive less than $21 per weighted pupil but which do not require a local tax rate as high as 36.4 cents to finance their part of the $70 program. Those communities may be limited to the amount of state aid now received unless more is demanded to equalize a $70 education.

As a result of these two adjustments, the state fund required is lowered approximately $800,000. With these final changes there results the proposed plan summarized at the beginning of this division.

VI. Adjustments to be made to tax rate and state fund.— These standards are for a $70 education. They may be adjusted to any other level by changing the tax rate and state fund. For each dollar's increase in educational level, above $70, add .743 to

the tax rate and $445,000 to the state fund. To decrease the level from $70, the same correction is subtracted.[13] For instance, to support a $71 education would require a tax rate of 36.4 plus .743 or 37.1 and a state fund of $62,500,000 plus $445,000 or $62,945,000.

The correction for the tax rate was obtained by taking one forty-ninth of the tax rate necessary to support $49 on the small-fund basis. This is one forty-ninth of 36.4 cents per $100. The correction for the state fund is made up of the $434,000 required to equalize one dollar on the small-fund basis, and one forty-ninth of the $543,000[14] necessary to make up the deficiency caused by undertaxing the most able communities. The correction would be made to the $49 part of the program, since, as long as the New York City rate is used, it will be most advantageous to hold the minimum obtained under the present plan at $21.

Figuring Inequalities from Other Types of State Aid

If an element of education that is not rightly a part of a minimum equivalent program is considered in figuring the needs of those communities which offer that element, the inequality introduced may be measured by dividing the total cost of such element of education—state and local support—by the total cost of the minimum program. The result will be the fractional increase of burden.

If a separate fund were established, however, to reward effort in this particular phase of education, the resulting inequality would be measured by the amount of this state fund, only, divided by the total cost of the minimum program.

Administrative Problems

A word must be said here of the administrative problems involved. The simplicity of aim has made it possible to come to

[13] The 1925 Legislature passed an equalization law based upon the plan under discussion. Since it substituted a $43 program for the $70 program, the local rate of contribution to the minimum program was reduced to 15 cents per $100 full valuation of property. Education Law of the state of New York. 1925, Section 491-b.

[14] In Section IV this is $623,000 but Section V reduces it by $80,000.

a definite conclusion on more elements than has been common in developing state-aid plans, but a complex administrative system is not necessitated. The plan for determining amount of state aid introduces no strange machinery or new terminology. The weighted-pupil standards are expressed as so much allowance for a pupil[15] and so much for a district, all districts being grouped into seven classes. The community locates its size group and applies the pupil figure to its average daily attendance and adds the district figure. The ultimate plan need not mention anything about the large-fund and small-fund parts of the plan—the $21 and $49 parts of the $70 program. This is all bound up in the minimum tax rate.

The plan as developed is independent of the size of the local taxing unit. This can be decided, so far as the equalization of a satisfactory minimum program is concerned, without regard to the problem of support.

[15] In the New York Equalization Law to which reference has been made, the $43 education is expressed as $1,200 per elementary teacher and $1,600 per high-school teacher. A provision is then introduced defining the "teacher" as a cost unit based upon the weighted pupil standards. Education Law of the State of New York, *vide supra*.

THE CONDITIONAL VALUE OF A LONGER SCHOOL YEAR IN ONE-TEACHER SCHOOLS

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The need of a longer school year in the one-teacher elementary schools has frequently been urged as the most important factor toward the equalization of instruction in these schools and in the graded elementary schools. In connection with a recent study of pupil achievement in one-teacher schools in Kansas data from schools having different lengths of school year were made available. From these data a comparison was made of the achievement of 861 pupils attending one-teacher schools for eight months of each year with the achievement of 334 pupils who were attending one-teacher schools in the same region for seven months. Then an analysis was made of the effect of different degrees of regularity in school attendance in these one-teacher schools. A total of ninety-eight schools in fourteen counties located in different parts of the state were included.

COMPARISON BY LENGTH OF SCHOOL YEAR

Standardized tests were given in these schools during the months of December and January. Uniform testing procedure was followed, and the work was done by persons who had been trained for the task in teacher-training institutions of the state. The tests used were: the Courtis Arithmetic Test in Fundamentals, Series B; Burgess Silent Reading Test, Form 1; Buckingham-Ayres Spelling Scale, List W, 20 words; Willing Composition Scale; Ayres Handwriting Scale; and the National Intelligence Test, Scale A, Form 1. All tests were given in grades III to VIII except spelling which was given only in grades VI, VII, and VIII. The median achievements of pupils from the seven-month and eight-month schools in the several subjects are compared in Table I. The nine-month schools are omitted, for the number of pupils tested was small.

In two of the three grades tested the average spelling scores were better in the seven-month schools than in the eight-month schools. Likewise, in the addition and multiplication tests the median scores of pupils in the seven-month schools equalled or surpassed those in the eight-month schools in more than half of the grades tested. The comparisons in the subtraction and division tests were so similar to these that they are not repeated in this table. In written English composition the pupils attending the shorter school session excelled in grades III, IV, and VI. These facts offer little proof that achievement is greatly affected by an additional month each year of the teaching now provided.

The pupils enrolled in the longer sessions get one-seventh more schooling each year than do the pupils of the seven-month term. The pupils in the eight-month school have had, by the end of the seventh grade, one year or seven months more schooling than the pupils who attended the shorter session. Yet, when the differences between the median scores of the two groups were converted into percents of normal yearly progress in each subject, in no grade did pupils attending the longer session have differences of scores in their favor which gave an average closely approximating even a half-year of achievement measured by these tests. In grades VII and VIII the pupils attending schools having the longer session show a marked tendency toward higher achievement scores. Below the seventh grade the difference in median scores, as shown in Table I, favors the eight-month schools in only nine of the twenty subject and grade comparisons —a difference of zero results from two of the comparisons.

Apparently something in addition to the extension of the length of the school year is needed to secure more effective results in the one-teacher schools. A different kind of schooling, rather than more of the same kind, seems to be needed.

Comparison of Attendance

The general bearing of the facts presented relative to the length of the school year is strikingly reinforced by an analysis

TABLE I. COMPARISON OF THE PUPILS' MEDIAN SCORES BY GRADES IN SEVEN-MONTH AND EIGHT-MONTH SCHOOLS OF THE ONE-TEACHER TYPE

Grades	Spelling		Reading		Composition	
	Seven-Month	Eight-Month	Seven-Month	Eight-Month	Seven-Month	Eight-Month
(1)	(2)	(3)	(4)	(5)	(6)	(7)
III	.....	.....	2.3	1.8	16.4	16.3
IV	.....	.....	3.6	3.7	22.6	20.6
V	.....	.....	4.7	5.2	25.6	27.2
VI	3.7	3.1	5.2	6.6	29.1	29.
VII	4.3	6.5	6.4	7.8	31.9	36.9
VIII	10.	9.5	8.5	8.6	34.	37.8
Number of pupils	190	439	295	759	334	861
Total	629		1,054		1,195	
	Handwriting		Addition		Multiplication	
	(8)	(9)	(10)	(11)	(12)	(13)
III	23.1	23.7	.7	.7	.....	.....
IV	23.2	24.8	1.1	1.5	.6	.8
V	26.3	29.	1.6	1.5	2.1	1.6
VI	31.8	31.1	2.5	2.4	2.8	2.8
VII	35.4	37.1	2.8	3.	3.8	3.7
VIII	38.6	39.5	3.8	3.7	4.9	5.
Number of pupils	334	861	334	861	276	727
Total	1,195		1,195		1,003	

of the relation of the attendance to the achievement of pupils in these one-teacher schools. The school-attendance records were secured, covering a period of two and one-half years, from the official, local and state records for 585 of these individuals. This number represented sixty-three one-teacher schools in nine widely distributed counties of the state.

In this analysis the pupils were classified into three attendance groups. Those who had attended 90 percent or more of the time that their schools had been in session during this period were designated as Group A; those who had been present from

TABLE II. DISTRIBUTION OF PUPILS ACCORDING TO GRADES AND ATTENDANCE GROUPS

	Grades						Totals
	III	IV	V	VI	VII	VIII	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Attendance Group A	40	46	47	57	54	89	333
Attendance Group B	32	32	28	16	16	25	149
Attendance Group C	18	14	18	13	14	26	103
Totals	90	92	93	86	84	140	585

80 to 89 percent of the time, as Group B; and less than 80 percent of the time, as Group C. This grouping according to attendance record was made irrespective of the length of school year. The three attendance groups, including 333, 149, and 103 pupils, were distributed among the grades as is shown in Table II.

The pupils' achievement scores in the Courtis Arithmetic Test, Series B, were tabulated separately for each attendance group in each of the grades tested.[1] A comparison of the median scores—all of which were below the standard scores—is presented in Table III.

The median scores of these three attendance groups in the four fundamental processes in arithmetic are not consistent with

[1] Tables III and IV were prepared by Mr. A. W. Glad in a Master's thesis on the "Relation of Rural-School Attendance to School Achievement," which was presented at the University of Kansas.

their attendance records. Group A had the highest median score in twelve of these twenty-three comparisons by grades and subjects, Group B in five, and Group C in five—one was a tie. It was only in grade v that Group A had the highest median score in the four tests. In grade VI, Group B excelled in three of the

TABLE III. COMPARISON OF MEDIAN ACHIEVEMENT SCORES IN ARITHMETIC BY GRADES AND ATTENDANCE GROUPS

	Addition	Subtraction	Multiplication	Division
(1)	(2)	(3)	(4)	(5)
Grade III				
Group A	.72	.68	.60	
Group B	.67	.68	.58	
Group C	.57	.54	.50	
Grade IV				
Group A	1.00	1.61	.89	.64
Group B	.80	1.00	.70	.59
Group C	1.50	1.50	1.00	.59
Grade V				
Group A	1.61	2.64	2.91	.74
Group B	1.11	1.85	1.43	.59
Group C	1.16	2.60	1.20	.65
Grade VI				
Group A	1.70	3.21	2.72	1.19
Group B	4.16	3.33	4.00	1.00
Group C	1.50	2.75	3.12	1.30
Grade VII				
Group A	2.82	4.87	4.43	2.40
Group B	2.50	6.00	4.16	2.33
Group C	3.50	3.50	5.20	2.00
Grade VIII				
Group A	3.95	7.03	5.36	3.96
Group B	3.62	6.50	4.90	4.83
Group C	2.50	6.00	4.30	3.33

tests, and A in none. Group C, the lowest attendance group, excelled in two of the four tests in grades IV and VII.

A similar comparison of the median scores in reading, composition, handwriting, and spelling is shown for the three attendance groups in Table IV. A comparison of median scores in this table shows that the pupils in Group A had the highest median in ten of the twenty-one comparisons by grades and subjects;

Group B, in seven; and Group C, in four. In no grade was Group A superior in all of the tests. Group C made a higher median score than Group B in eight of the comparisons, tying

TABLE IV. COMPARISON OF MEDIAN ACHIEVEMENT SCORES BY GRADES AND ATTENDANCE GROUPS

	Reading	Composition	Hand-writing	Spelling
(1)	(2)	(3)	(4)	(5)
Grade III				
Group A	1.80	18.3	22.6	
Group B	2.25	14.2	20.3	
Group C	1.25	14.3	20.7	
Grade IV				
Group A	3.08	19.3	22.7	
Group B	3.12	21.3	23.0	
Group C	3.66	21.7	26.7	
Grade V				
Group A	5.34	29.0	30.7	
Group B	5.50	27.5	28.5	
Group C	3.25	30.2	30.2	
Grade VI				
Group A	5.93	30.3	33.9	3.75
Group B	5.74	29.8	37.1	3.87
Group C	5.50	29.6	32.0	2.25
Grade VII				
Group A	7.66	35.9	36.9	8.00
Group B	6.75	39.8	39.5	4.85
Group C	5.17	31.5	39.0	7.00
Grade VIII				
Group A	8.70	37.5	39.8	10.00
Group B	8.33	33.4	38.3	10.50
Group C	7.37	33.4	35.5	7.00

with it in one, and reached a higher median than Group A in seven of the comparisons.

Significant in this connection is the fact, that pupils in the highest attendance group also had a longer school year than the pupils of the other two groups. Group C comprised only 9 percent of the pupils having nine months of school, and 37 percent of those having seven months of school. Accordingly it happens that Group C was in school a smaller percent of what was usually a shorter school year. Doubtless the average of days actually

attended by pupils in Group A exceeded that of Group C by at least one-third of the latter's school attendance.

Yet the results of the tests show that the median achievement of each of the two lower attendance groups frequently equalled or surpassed the median accomplishment of pupils in the highest attendance group. Evidently regular school attendance alone is not as important an influencing factor in school achievement in rural elementary schools as has ordinarily been assumed. Its value is at least conditioned by other factors.

Approximately 25 percent of the pupils in each attendance group had taken the National Intelligence Test, and the number so tested was almost equally distributed throughout the five grades above the third. No evidence of selection was apparent with reference to mental-test scores in any attendance group. The correlation between the percent of attendance of these pupils and their mental test scores was close to zero ($r = 0.05$). As might be expected, however, a much larger percent of Group C was retarded judged by chronological age and a smaller percent accelerated than was true in either of the other two groups.

Summary

Based upon the test results of this study, the value of an eight-month over a seven-month school year in the one-teacher elementary schools was not evident excepting in grades VII and VIII. Rarely was the difference in test scores, even in the more advanced grades, equivalent to a half-year of school progress.

In general, the pupils who had a higher attendance ratio also had a longer school year and made somewhat better scores than those less regular in school attendance, but they were frequently surpassed by the pupils having a lower attendance ratio. The different attendance groups showed practically no selection according to mental-test scores, but the lowest attendance group was most retarded chronologically. The correlation between attendance ratios and National Test scores was 0.05. The facts presented here suggest that the need for qualitative changes in these schools is as great as the need of a longer school year.

OVERCOMING SOME ADDITION DIFFICULTIES

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Teachers and principals are constantly confronted with the difficult problem of adapting the work of the school in specific fields to the needs of the individual student. The problem is so universal and insistent that the writer is prompted to present this discussion of a method of attacking the problem as applied to the teaching of arithmetic in his own school, in the hope that it may be useful to other teachers laboring under similar conditions.

After a special campaign in the school year of 1922-23, it was found that the majority of classes in the school was up to standard speed in the four fundamentals as measured by the Courtis Series B test. Only a very few were up to standard accuracy, 100 percent. This standard was especially difficult to attain in the case of addition. The highest grade median in addition was 70 percent with a few scattering individual cases at standard. The situation apparently called for a special remedy.

At the opening of the next school year tests in the four fundamentals were given. Grade medians for addition accuracy were as follows: IV-B, 38; IV-A, 47; V-B, 62; V-A, 46; VI-B, 54; and VI-A, 50.

The writer believes that nothing short of 100-percent accuracy is worth accepting in mathematical processes. Even though rate may be reduced, it can well be sacrificed if complete accuracy is thereby attained. Anyone who uses arithmetic after leaving the schoolroom is required to have absolutely accurate results in his work; and the school, if it does not make the same requirement, is not only failing to give the proper training, but it is even fostering an attitude among children which will be detrimental to their success as adults.

The problem which called forth this experiment and which is here discussed, therefore, dealt with accuracy in addition. Carelessness seemed to have become quite prevalent, as the grade medians given above clearly indicate. The aim of the pupils

seemed to be to complete a large amount of work rather than to be accurate in doing it. This was probably due to an overemphasis on time pressure. The children had, no doubt, formed wrong habits through continued exercise in "speeding up," and bonds had been formed which produced satisfaction through the completion of a number of exercises, even though the answers were wrong. The problem therefore involved a breaking down of the present "satisfiers" by substituting "annoyers" and creating a series of "satisfiers" produced by accurate results. The increased interest manifested on the part of the pupils became evident when they began to discover that it was almost as easy to get the correct answer as it was to get the wrong one. Moreover, it was much more satisfactory.

The Courtis tests in addition consist of columns of nine addends each of three digits. The procedure followed in this experiment took this fact into account. The grades mentioned above were given tests on consecutive days as follows:

On the first day the forty-five combinations in typewritten form such as

3	7	2
2	3	1
—	—	—

were handed to each child, face down. Upon the back of the sheet he wrote his name. Then at the signal "Go!" the paper was turned over and the child wrote the results of each addition combination as quickly as possible. Time was placed on the blackboard in intervals of ten seconds so that each child might know approximately the period needed for him to finish the work. This was also copied upon the back of the sheet with his name. The children were allowed all the time necessary to complete the work, but they were urged to see how quickly they could finish the exercises. Nothing more was said about accuracy than is always said in giving such tests.

On the second day the same process was repeated except that the exercises to be added were three figures in length instead of two, such as

3	1	6
5	8	5
7	6	4
—	—	—

On the third day the columns were of four figures; on the fourth day they were of five figures; and so on until on the eighth day they were of nine figures.

The papers were corrected after each day's work, and the results were tabulated for each child so that by the end of the

eighth day, a complete record was available indicating the ability of each child on each type of exercise. Table I is an illustration of the way the record of one of the grades appeared. A similar table was arranged for each of the other grades.

TABLE I. THE PERCENTAGE RECORD OF THE PUPILS IN ONE GRADE ON EACH OF THE NINE TESTS

Pupil	Exercise Number							
	1	2	3	4	5	6	7	(8[b])
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	100	88	90	90	93	87	83	87 (2)
2	100	96	100	93	80	97	83	67 (2)
3	100	96	90	77	90	90	90	90 (1)
4	100	100	100	100	97	97	97	93 (1)
5	98	94	97	67	87	80	67	73 (2)
6	100	100	97	83	50	57	30	37 (2)
7	100	96	93	97	97	100	100	97 (1)
8	98	92	93	93	83	93	90	90 (1)
9	93	92	67	43	13	17	7	3 (2)
10	95	100	97	100	77	97	83	60 (1)
11	93	90	70	83	73	70	33	27 (2)
12	100	100	97	93	93	100	93	93 (1)
13	100	100	100	100	87	93	87	90 (1)
14	100	98	97	93	97	100	97	93 (1)
15	100	94	97	80	70	77	40	37 (2)
16	...[a]	...[a]	...[a]	...[a]	77	60	53	63 (2)
17	...[a]	...[a]	...[a]	...[a]	83	80	37	...[a](2)

[a] Absent.

[b] The figures in parentheses indicate the section in which the child was placed.

It will be noticed upon examination of Table I, that in cases which did not follow a rather consistent percent throughout the eight sets, a distinct drop appears either between 3 and 4, or 4 and 5. It might be added that this condition existed in each of the grades. That is, the tests apparently selected those children who had difficulty in holding their attention upon a column of more than five figures, and also indicated which children experienced no such difficulty. For example, Pupil *3* in Table I was as accurate in adding a column of nine figures as in adding a column of four figures. Hence that pupil was placed in Section 1.[1] On the other hand, Pupil *6* illustrates the type of child

[1] See figures in parentheses in column *9* of Table I.

whose accuracy score was very low as soon as the columns became over five figures in length. Accordingly he was placed in Section 2 which comprised pupils of that type.

The classes engaging in the experiment were divided in such a way that all pupils who were able to add a column of nine figures as well, or nearly as well, as they could a column of four or five figures were placed in Section 1, and the others were placed in Section 2. A different method of addition was then given to each section. No attempt was made to evaluate the relative effectiveness of the methods, but they were merely arranged to provide for the needs of the individuals who had difficulties of a similar character.

The pupils assigned to Section 1—the section number is shown at right of Table I—were told to add the Courtis columns using the following method:

	55	
339		
276		
977		35
861		53
757		46
698		
269		
136		
322		
4,635		

The first column to the right totals 55, which is placed at the right of the column. A check is at once made by adding the column the other way. The first number in this answer, 5, is then placed above the second column which is added in the same way and the answer, 53, placed at the right below the one for the first column. The first number of the sum, 5, is placed at the top of the third column which is then added as usual, and the sum recorded below the others at the right. Then the first numbers of the first and second answers are scratched and the answer is written down, 4,635, as shown in the example given.

Those who were assigned to Section 2—shown at right of Table I—were told to add the Courtis columns using the same methods as Section 1, except that they were instructed to divide the columns near their midpoint and add each half, in turn adding the two totals for the final result. In other words, the abil-

ity of each child as shown in the first series of problems was taken into account in the assignment of further drill.

The children were then drilled on the new methods for a week after which they turned their attention to the other operations. In another two weeks they were drilled again on addition and at the end of that week a Courtis test, Series B, was given. The

TABLE II. A GRADE RECORD SHOWING THE SCORES ON COURTIS TEST, SERIES B, IN THE FIRST AND FINAL TESTS

Pupil	Percent of Accuracy	
	First test	Final test
(1)	(2)	(3)
1	71	80
2	50	100
3	0	100
4	71	100
5	50	100
6	0	100
7	33	100
8	75	100
9	0	100
10	25	0
11	25	100
12	87	100
13	33	50
14	71	100
15	60	50
16	0	100
17	60	67
18	50	100
19	0	100

results of this test showed a decided increase in the median accuracy for the classes. The drill was dropped for a short time, then another test was given after a short relearning period. The results which were then obtained are shown in Table II. In this table, which is only one of several grade records, and which refers to the same pupils who are shown in Table I, the initial and final scores of the pupils are compared. That is, Pupil *2* was 50 percent accurate in Addition in a Courtis Series B test given at the beginning of the experiment and the same pupil,

after drilling with Section 2 was 100 percent accurate in another form of the same test given at the conclusion of the experiment. In the final test, the pupils in Section 2 were permitted to divide the columns as they had done in their practice work. Pupils *18* and *19* were absent throughout the first part of the experiment but were arbitrarily placed in Section 2, this action being based upon a personal knowledge of their ability.

TABLE III. RECORD OF ALL THE GRADES ON THE TWO TESTS USING THE COURTIS TEST

	IV-B	IV-A	V-B	V-A	VI-B	VI-A
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	First Test					
100	1	.....	2	1	.....	.....
90– 99	.....	1	1	.....	1	.....
80– 89	.....	3	2	1	2	1
70– 79	1	.....	1	3	1	4
60– 69	2	5	3	1	4	3
50– 59	5	3	3	2	6	2
0– 49	16	13	5	9	9	10
	Final Test					
100	18	15	13	11	14	14
90– 99	.....	.....	.....	.....	1	.....
80– 89	1	.....	.....	.....	2	1
70– 79	1	3	1	1	.....	.....
60– 69	1	4	3	2	2	1
50– 59	3	2	.....	1	3	2
0– 49	4	2	.....	.....	3	1

Examining Table I in the light of the results of the later tests given as shown in Table II, the writer is frank to confess that there were at least three pupils who were not placed in their proper section, namely, Pupils 1, 10, and 13. Pupil 1 could, no doubt, have done as well in Section 1 as in Section 2 and Pupils 10 and 13, in all probability, could have done much more accurate work if they had followed the method of Section 2. At the conclusion of the experiment these pupils were transferred to the other section.

Table III is given to show what was accomplished in all the grades concerned in the experiment. The upper half of the table distributes the pupils according to their scores in the Courtis test given in September, 1923. The lower half of the table distributes the same pupils according to their scores in the Courtis test given in January, 1924. For example, in grade IV-B, one pupil was 100 percent in accuracy in the September test, and eighteen pupils were 100 percent in accuracy in the January test. From a study of Table III it will be seen that our objective was reached in each grade, namely, a grade median of 100 percent in accuracy.

From this experiment, it appears that the difficulty of a large proportion of those children who were not accurate in column addition, such as is included in the Courtis test, lies in the fact that they cannot hold their attention to the task long enough to complete the entire column accurately.

It also seems possible to select those pupils who have difficulty in adding long columns of figures and to provide a method which will help them overcome that particular difficulty in so far as accuracy in the process is concerned.

The foregoing merely describes a method as it was actually used. It can be used by anyone. Everything of a complicated nature was avoided and no extra time was required for it. Such splendid results were secured that the method can be strongly recommended to anyone whose pupils encounter special difficulties in column addition.

WHAT WE ARE FAILING TO MEASURE IN EDUCATION

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"Failure to measure" may arise either from failure to make effective use of the available instruments or from failure to measure the traits which we need to measure. I shall confine my remarks primarily to capacity tests. This field, although the best worked, is probably less well developed toward its maximal perfection than is the field of educational or subject-matter tests. Without much of a stretch of the imagination, however, many of my conclusions may likewise be applied to educational tests.

Prediction is the primary purpose of those who give capacity tests. Obviously, therefore, our first efforts should be directed to salvaging as much prediction as possible from the measures already available or which can be made available with a slight amount of effort. We may consider a few of these.

BETTER USE OF AVAILABLE DATA

Scoring formulas.—In the first place, scoring formulas for mental tests have usually been found to be of such small advantage that they are seldom used in tests issued by commercial houses. Undoubtedly, one of the chief reasons for this is the fact that the number of errors on a pupil's paper is of small magnitude and consequently is unreliable. The result is somewhat analogous to chance errors, and the multiple correlation coefficients computed from the scoring formulas reflect this fact. If this is the true explanation of the case, then this condition would not hold for the *sum of the errors on all of the tests combined*. We should experiment at greater length with the simple procedure of adding up all the errors on all tests of the scale and then using the total number of errors as a measure. Thurstone does substantially this in his clerical test.

Lengthening the tests.—In the second place, and far more important, few test workers know of the existence of a formula which enables one to predict the validity of a test when it is increased in length. Doubling a test in time limit and amount of content not only increases its reliability but normally increases its validity as well. Application of this formula indicates that for probably a large majority of commercial tests an improvement in the validity would be effected by increasing their length up to, say, *three or four hours.* Beyond that time, little is to be gained by merely lengthening a test. In order to obtain still higher validity, one would be obliged to search for *unique* tests, as defined below. The value of suspected unique tests, however, often lies almost wholly in the fact that their use is but a time increase in the length of the testing program.

In most commercial tests the one great advantage in lengthening them to three or four hours would be the ironing out of the unreliability of the tests due to fluctuation from day to day in the individual test scores. When constructing a new test at the present time we do not know whether its correlation with a second test is due to true relationship or whether it is due in large part to the short-time limits, or just what factors do affect it. The Spearman-Brown formula yields reliabilities well above 0.90 for a large majority of commercially available tests when their time limits are increased to three or four hours. I am suggesting, therefore, that in our experimental work, in particular, and in our practice, as far as possible, it would be advisable for us to give only tests with a time length such that reliability coefficients of 0.90 or above may be secured. The low relationship between mechanical ability and intelligence is in part due to the fact that the mechanical assembly tests now available are too short. The importance of this matter has been forcibly brought to my attention by the vocational inquiry of the University of Minnesota. The research workers engaged in this project have repeated their tests as many as eight times in certain instances. They undertake to obtain a test score for an individual which shall represent a close approximation to his *true score* in the ability in question.

Any correlations between such true scores[1] of tests will then be the true relationships at issue, or a close approximation thereto.

Additional available data.—Let us now pass to another aspect of salvaging our present measures or tests. There are often in existence a number of other factors which, although not ordinarily available, can readily be made available at small effort. Some of these factors may materially increase the predictions made from intelligence tests.

Miss Ferguson, a research student in the Department of Psychology of Ohio State University, has found that the following measures and some fifty others may readily be determined by visits to the Registrar, the Entrance Board, the Dean of Women, the Dean of the College, the Physical Education Departments, and the offices of campus publications. Each of these variables is susceptible to statistical use and treatment as a test. Not all of them are available at college entrance, but those which are available will surely improve the validity of our prediction. Each should throw some light on the factors in college success.[2]

ADDITIONAL AVAILABLE DATA

1. Was the student born in the city, within the state, or outside the state?
2. Is the student a fraternity member or not?
3. The number of activity points carried, according to the activity-point system of the university. This is a measure of the strenuousness of the outside activities of the student.
4. The number of high-school credits allowed the student upon entrance to the university.
5. The number of hours of work carried per quarter or per semester by the student.
6. Whether the student is, or is not, earning a portion of his expenses by working for self-support.
7. Scholarship marks and absences in the survey or orientation course taken in common by all students of a college.
8. Strenuousness of sport activity in physical education selected by

[1] A true score is the average of an infinite number of tests. How fortunate then that three hours of testing approximates both as to reliability and validity the results of an infinite amount of testing!

[2] At this point, however, it should be stated that an infinite number of such factors would scarcely raise our predictions of scholarship to a validity coefficient of 0.80.

student. Some students elect archery, a mild form of exercise, others elect volley ball, a strenuous sport.

9. Whether or not the student bought a student athletic ticket.
10. Whether or not the student subscribed to the daily paper of the university.
11. Whether or not the student bought a copy of the college annual.
12. The student's attitude toward required class attendance. This can be indirectly measured by the number of gymnasium and military "cuts" when a definite number is allowed. In colleges where a strict account is kept of all absences and a definite number of "cuts" is allowed, this measure is readily obtained.
13. The name of the student's roommate. It is found that there is a positive correlation between the intelligence of roommates, the intelligent student in general tending to pick out an intelligent roommate. It remains to be seen whether and to what extent the scholarship of a student may affect or may be indicative of the scholarship of his roommate. Does the non-studious roommate teach his studious brother to become non-studious?
14. Whether the student lives in a dormitory, in a rented room in the city, or with relatives. The number of roommates is also obtained.
15. Rating of the student's high school as to size, number of teachers, and grade of school as determined by the State Department of Instruction.
16. A great many items from the student's health card in regard to physical measurements, health, etc.
17. Whether the high-school graduate is in the upper, middle, or lower third as judged by the principal of the school.
18. Number of years residence in the state.
19. The church membership of the student.
20. Changes required by the student in schedule cards, fee cards, late registrations, etc.

In the prediction of high-school scholarship it has been found that a much under-valued measure is the elementary-school marks. These are generally obtained from the principal's office at the completion of the eighth grade provided the elementary school has an adequate child-accounting system. The work of C. C. Ross has demonstrated that adequate marks of the entire grade-school career of a pupil predicts high-school career far better and more consistently than any intelligence test, and at no expense other than a few minutes of work on the adding machine —a smaller amount of labor than is required to score a mental

test.[3] May we not hope that high-school marks will be as useful in predicting college success as grade-school marks are in predicting high-school success?

In college it has been found that the student's subsequent career until graduation can be foretold with high accuracy by his cumulative college record available at the end of the first year. This is possibly a powerful incentive measurement. It may be had with little effort. The student himself can compute it, if given access to his scholarship records. The average correlation of first-semester college marks in all college studies in seventeen universities is 0.66, as shown by the results of a recent questionnaire. The Spearman-Brown formula[4] would lead us to believe that the cumulative record of two semesters (freshmen marks) would predict the next six semesters' record (average marks in last three years of college) to the extent of a correlation of 0.86, a correlation which is high enough for making a rather reliable prediction of the student's probable academic success.

We are failing to measure or to appreciate the magnitude of the incentive value which comes to the student by the method of self-rating, particularly in diagnostic tests which point out the student's strengths and weaknesses. Mr. H. H. C. Chou has found that the most promising thing, by far, to be done in teaching pupils how to write good compositions is to have them rate compositions on a composition scale.[5] He found correlations above 0.70 between ability to write compositions and ability to judge them.[5] Mr. R. E. Smith at Ohio State University, finds that the average mark given a shop product by three students correlates higher with the instructor's rating than one instructor's

[3] *The Relation between Grade-School Record and High-School Achievement.* New York, Teachers College, Columbia University, 1925. 70 pp. (Teachers College, Columbia University, Contributions to Education, No. 166)

[4] Kelley, T. L. *Statistical Method.* New York, Macmillan Company, 1923. p. 205. Formula No. 156.

[5] Chou, H. H. C. *The Measurement of Composition Ability.* 1923. 108 pp. (A thesis, privately published and not for general distribution, submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Columbia University. No imprint of publisher in the book. It may be had as a library loan from Columbia University.)

rating correlates with another's when both students and instructors use a carefully worked out rating scale based on measuring tools such as the rule, try-square, or caliper. Can we not prophesy that ten years from now, when we shall have measured the incentive value of self-rating, the student will do practically all the marking, thus leaving the teacher's time free for other things?

The testing world may be said to be awaiting eagerly the outcome of the results of Dr. Thorndike's inquiry into the acuity, the breadth, and the speed of intellect.[6] Not only may the Bagley-Terman controversy be readily settled by an appropriate outcome of this experimentation, but a new shift in emphasis as to what and how we should test may likewise be inaugurated.

Unique Capacities

A unique capacity from the point of view of this paper is one which correlates as nearly zero as may be with at least some one objectively measured trait and which also correlates positively with one or more criteria of success in the different lines of endeavor represented by the school situation.

Having salvaged, in so far as possible, the predictive value to be obtained from the above variables and categorical measures of a student's capacities, abilities, and interests, it behooves us to set about determining some of the as yet unmeasured unique traits of human measurement which function in the school situation. At the present time we can possibly make a shrewd guess as to the names of these unique capacities. Some unique traits which have been suggested by others or which have occurred to me are given in Table I. The appropriate magnitude of the correlation between the two traits or tests is known in the case of that relationship which has x at the compartment of intersection of the two traits or tests.

There are 171 basic relationships possible among the nineteen variables in Table I. Of these we have done adequate research in about eight, or in less than five percent of the possible

[6] Thorndike, E. L. "The Improvement of Mental Measurements," *Journal of Educational Research*, 11:1-11, January, 1925.

TABLE I. A LIST OF ASSUMED UNIQUE TESTS

Trait or Test	Age	Intelligence	Stenquist Assembly	Garfiel's Tests	Social Capacity	Physical Strength	Health	Moods and Emotions	Character Traits	Glandular Secretions	Psychopathies	Metabolism	Ossification	Psychomotor Tests	Machines for Testing Muscle Groups	Music—Rhythm	Sentiments and Attitudes	Athletic Agility	Self-sufficiency*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1. Age	—	×	×			×													
2. Intelligence		—	×	×		×								×				×	
3. Stenquist's Assembly Test			—																
4. Garfiel's Tests				—															
5. Social capacity					—														
6. Physical strength						—													
7. Health							—												
8. Moods and emotions								—											
9. Character traits									—										
10. Glandular secretions										—									
11. Psychopathies											—								
12. Metabolism												—							
13. Ossification													—						
14. Psychomotor tests														—					
15. Machines for testing muscle groups															—				
16. Music-rhythm																—			
17. Sentiments and attitudes																	—		
18. Athletic agility																		—	
19. Self-sufficiency*																			—

*Ability to amuse self.

relationships. We have 95 percent of the task still ahead of us. Depending upon one's personal judgment, one may place *x*'s in a few more or a few less compartments of Table I than those already so marked.

If we had determined a list of twenty such unique measures for an individual, we should be able, by means of appropriate regression equations, to make predictions of human aptitude which would make our present attempts seem puerile indeed. Such tests may make possible a rough working basis for positive vocational and educational guidance—guidance of the pupil into that one of a number of competing fields of interest in which his chances for success are greatest.

Elsewhere I have pointed out that a great many of these traits may be expected to be rather complicated and to involve a number of almost unique capacities in themselves.[7] For instance, motor ability has been shown to be a complicated capacity and has been partially analyzed in the aforementioned classification.

Cooperative research.—This brings us at once to the problem of how we can best determine the magnitude of the remaining 163 correlations. I think the answer consists in cooperative effort. At present the school psychologist deals in his experimental work with his own particular group of people, the school administrator with his own group, the clinical psychologist with his group, and the educational psychologist with his group. Only by chance are the numbers of the several experimental groups the same. Obviously if all these experimenters were to obtain their data from the same group of individuals, a slight amount of additional coordinating work would enable us to obtain information hitherto quite impossible by reason of the magnitude of the labor involved in obtaining it—a labor so great that individuals, working non-cooperatively, have as yet scarcely made a beginning. As a practical method of getting started on some of the broader problems outlined above I suggest the rather obvious task of getting our colleagues in the various sciences

[7] Toops, H. A. "The Need for Norms in Vocational Guidance," *Vocational Guidance Bulletin*, 3:87-90, December, 1924.

interested in making a thorough examination of the same group of students and of pooling their results in the interest of progress in each field. In this procedure I can see an immediate need for the services of the psychologist, the physical-education specialist, the nutrition expert, the anthropologist, the zoologist, and the chemist. No doubt there are others. May it not be true for example that our college students of high intelligence but low accomplishment are low in basic metabolism? Basic metabolism is a measure of the amount of energy expended per unit of weight as measured by the carbon-dioxide content of expired air. This can readily be measured by the physiologist. Possibly unusual ambition—even such things as a liking for mathematics instead of liking for appreciation courses in English—may be influenced by basic metabolism or by the relative physical size of one's heart. Size of the heart may be measured by the X-ray operator with the fluoroscope.

Medical men advise that techniques are available for measuring samples of food in the stomach and after leaving the stomach in the duodenum; for measuring the average length of time required for food to pass the length of the alimentary canal by the simple process of staining the food; for the length of time taken by a drug, say turpentine, to pass through the urinary system. The zoologist may make his contribution. Who would care to venture a suggestion in regard to the effect upon scholarship of the presence in one's alimentary canal of a dozen of the two score or more parasites which infect the human alimentary canal? Would not such a person have his motivation affected thereby? The hookworm of the South is a case in point.

Every teacher is conversant with the fact that bad eyes play a part in scholarship. The teacher may be a very important worker in the program to which I am referring. We have failed to evaluate her worth in this respect.

Some Characteristics of Cooperative Research

In order to determine these unmeasured factors, I have already indicated that cooperative research is desirable. This research will provide in the main for three things:

1. As far as possible, the individual researches carried on by pedagogues, school administrators, educators, psychologists, clinical psychologists, vocational-guidance testers, and others of a given institution or locality will all use the same test subjects. It is obvious that if the school administrator needs to know the correlation between age and intelligence-test score, it is a great waste of his time to have to give intelligence tests in order to determine the correlation. The school psychologist either already has the correlation or has the data from which it can be obtained with a minimum of effort.

2. All research workers will use standard statistical, experimental, and quantitative measures and procedure in order that all shall understand the same thing by all of the results secured and that the maximum of efficiency in the routine work of experimentation may be secured.[8]

3. Whenever such cooperative research is carried on, there will need to be some person or body of persons to integrate and expound the results of the various researches from the point of view of education.

It is to be noted that each science will be specifically concerned in developing the total research as related to the particular science in question. At present we have few psychologists or school administrators or educational philosophers capable of integrating into educational principles and practices the results of research in a varied number of fields. In this connection, we are utilizing at only a fraction of their potentiality the research methods of library investigation. I was quite surprised to find that, with a comparatively slight amount of labor, we could locate a bibliography of 365 titles on university intelligence tests, and over 1,500 titles on vocational guidance. In spite of this vast volume of literature in the two fields, we have yet to see a comprehensive philosophical treatise of either of them.

The plan as outlined above does not require the different scientists and educators to be "under the direction of" anyone. It

[8] As a case in point, the correlations based on small gross scores when N is less than 50 can probably be more effectively worked out by one particular method than by a host of other possible methods.

does not require that investigations undertaken be practical in any sense of the term. Cooperation, as above defined consists merely in the attempt to coordinate our efforts by adopting the best methods of research, by using as far as possible—and this is the most essential of all—*the same persons as subjects* for all of our numerous researches, and by thus making it possible for someone to interpret the meaning of the whole. The total educational research effort expended annually in the United States if spent on one group of one thousand children would probably advance the science of education as much as would years of our present method of investigating isolated problems.[2]

[2] The advantages of cooperation may be concretely expressed by making the following hypothesis: Suppose we had in one university in any one year fifteen Ph.D. candidates each of whom was capable of constructing and standardizing one of the above fifteen unknown tests but no more. The fifteen might either use the same or different groups of subjects. If each worked alone, we might readily know, as the result of one or two years of work, the magnitude of fifteen or possibly more of the correlations in the first horizontal row of the table. (We are here making the gratuituous assumption that the fifteen unknown tests could be constructed without cooperative effort.) At the same rate we might complete the table in the next ten or twelve years.

If, however, two students should use the same test subjects, the work of the two would yield three correlations or one and one-half correlations per research worker instead of only one; if three students used the same subjects, the same effort would yield six correlations or two correlations per person; if ten thus cooperated the same effort would yields fifty-five correlations or five and one-half correlations per person; and if fifteen thus cooperated, the contribution would be eight correlations per research worker, and so on, the contribution increasing in geometrical progression with the increase in the number of researches carried out on the same subjects.

THE S. P. G. MYTH: A NOTE ON EDUCATION IN COLONIAL NEW YORK

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Andrew S. Draper, writing in 1890, accounts in one sentence for a long period in the educational history of New York: "All the English schools in the province from 1700 down to the time of the Declaration of Independence were maintained by a great religious society, organized under the auspices of the Church of England, and, of course, with the favor of the government, called 'The Society for the Propagation of the Gospel in Foreign Parts.' "[1]

Dexter, whose *History of Education in the United States* appeared in 1904, was somewhat more cautious: "Up to the time of the Revolution the elementary schools in New York City were largely fostered and supported by the Society for the Propagation of the Gospel."[2] Not "all the English schools in the province" it will be noted, but just the "elementary schools in New York City." Evidently Palmer, in his account of the development of "free education in the city of New York," preferred not to tamper with Draper's phraseology.[3] This interesting quotation appears again in Cubberley's *History of Education*.[4]

How many "schools in the province from 1700 down to the time of the Declaration of Independence were maintained" by the S. P. G.? Kemp, who has published the only source-account of the work of this society in New York, says, "In the colony of New York, the Society from 1710 to 1776 continuously

[1] Draper, A. S. *Origin and Development of the New York Common School System.* Albany, J. B. Lyon, 1890. p. 12.

[2] Dexter, E. G. *History of Education in the United States.* New York, Macmillan Company, 1904. p. 77.

[3] Palmer, A. E. *New York Public School.* Being a history of free education in the City of New York. New York, 1905. p. 11.

[4] Cubberley, E. P. *History of Education.* New York, Houghton Mifflin Company, 1920. p. 369.

supported between five and ten elementary schools."[5] According to Draper, and those who have accepted his statement without reservation, there were no other English schools in New York during this period.

So far as I know, this generalization has gone unchallenged. I have a notion that there were many "English schools" in the Province of New York from 1700 to 1776 which were not "maintained by a great religious society." A few of them are listed here:[6]

Robert Parkinson, New York City, 1702 (1:76)
John Sellwood, New York City, 1702 (1:82)
Dan Thwaites, New York City, 1703 (1:85)
Andrew Foueautt, New York City, 1703 (2:90)
Henry Lindley, Jamaica, 1705 (2:91)
Thomas Huddleston,[7] Jamaica, Southold, Rye, 1705, 1708, 1714 (2: 91, 112, 116)
Elizabeth Hand, Easthampton, 1706 (3:III, 154)
Alexander Baird, Hempstead, 1706, 1708 (2: 92; 4: 77)
Edward Fitzgerald, Westchester, 1706 (2:93)
James Jeffray, New York City, 1706 (2:92)
John Stevens, New York City, 1708 (4:77)
Thomas Mecken, Jamaica, Flushing, 1708, 1709 (4: 77; 2: 94)
John Bashford, New York City, 1708 (4:77)
Cornelius Lodge, New York City, 1708 (4:77)
Daniel Clark, Westchester, 1710 (2:114)
Allane Jarrat, New York City, 1712 (2: 93)
Robert Macbeth, Huntington, 1713 (5:II, 310)
John Conrad Codwise, New York City, 1715 (Mayor's Court Minutes, May 24, 1715 to April 29, 1718, 26)
James Battersby, Flushing, 1715 (2:121; 11: 427)
Peter Parvisol, New York City, 1720 (6:63)
George Sheriosby, Westchester, 1721 (2:118)
George Browning, New York City, 1721 (Mayor's Court Minutes, May, 1720 to August, 1723, 179)
George Brownell, New York City, 1722, 1731, 1733 (6: 145)[8]
William Glover, New York City, 1722 (1:102)
James Loquart, Jamaica, 1722 (2:118)
Thomas Lynstead, Oyster Bay, 1723 (2:118)

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[5] Kemp, W. W. *The Support of Schools in Colonial New York by the Society for the Propagation of the Gospel in Foreign Parts.* New York, Teachers College, Columbia University, 1913. 279 pp. (Teachers College, Columbia University, Contributions to Education, No. 56)

[6] *See* page 136.

[7] Huddleston was not an S.P.G. teacher before 1714. Kemp, *op. cit.*, p. 77.

[8] *See also* 7: June 14-21, 1731; 8: February 18, etc., 1733.

James Weeks, New York City, 1723 (1:103)
Peter Fineh, New York City, 1725 (1:106)
Jonathan Sherer, New York City, 1725 (1:105)
Edward Gatehouse, New York City, 1728, 1731, 1740 (1:111)[9]
Mitchell Somersett, New York City, 1729 (Mayor's Court Minutes, January 26, 1724 to June, 1729; Ms. folio in N. Y. Hall of Records, pages not numbered.)
James Delpech,[10] Eastchester, 1729 (4:161)
Edward Davies,[11] Southampton, 1729-32 (2:111)
..... Charlton, New York City, 1729-53 (2:113)
James Lyde, New York City, 1730 (7: August 31-September 7, 1730)
William Rock, Jamaica, 1731 (2:118)
Alexander Malcolm, New York City, 1732-39 (2:124-41; 25:IV, 73)
William Thurston, New York City, 1732 (7: August 28-Sept. 4, 1732)
Daniel Shatford, New York City, 1735 (1:128)
John Cavelier, New York City, 1736, (1: 130; 24: 48)
Charles Henley, New York City, 1737, (1:131; 24: 109)
Joshua Ring, New York City, 1737 (8: April 4, 1737)
Walter Hetherington, New York City, 1739 (2: 142; 11: 538)
James Foddey, New York City, 1740 (8: March 24, etc., 1740)
Thomas Allen, New York City, Cortlandt, 1740-41, 1752, 1763 (1: 142)[12]
John Campbell, New York City, 1741 (11: 552; 8: April 6, etc., 1741)
John Ury, New York City, 1741 (11: 553, 565)
Henry Peckwell, New York City, 1741-69, 1771 (9: VI, 106, 307)[13]
Edward Mariner, New York City, 1742 (1: 144; 24: 571)
Samuel Dunlop, Cherry Valley, 1743-44 (2:143)
Charles Johnston, New York City, 1744, 1748, 1752 (7: March 5, 1744)[14]
George Gordan, Rye, 1745, 1761 (9: VI, 77, 128)
Malcolm Campbell, New York City, 1746 (1:156)
George Bingham, New York City, 1747 (14: August 3, 1747)
Joseph Blanchard, New York City, 1747 (14: August 3, 1747)
Thomas Metcalfe, New York City, 1747 (14: August 3, 1747)
Henry Moore, New York City, 1747 (7: June 1, 1747)
Augustus Vaughan, New York City, 1747 (14: October 26, 1747)
Archibald McEuen, New York City, 1747, 1750, (1: 159; 7: August 6, etc., 1750)
Charles Johnson, New York City, 1747 (1: 158)

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[9] *See also* 7: October 4-11, 1731; 8: March 24, etc., 1740.

[10] Kemp, *op. cit.*, p. 161, "There is nothing to indicate that he was then under S. P. G. auspices."

[11] Davies did not become a S.P.G. teacher until 1732. (Kemp, *op cit.*, p. 191)

[12] *See also* 9: VIII, 35; 24, 432; 1: March 16, etc., 1752.

[13] *See also* 9: VII, 56, 304; 1: 209; 12: April 15, etc., 1771.

[14] *See also* 13: 273; 7: May 11, etc., 1752.

Cornelius Linch, New York City, 1748 (7: July 4, etc., 1748)
John Clarke, Brooklyn, 1749-50 (7: December 4, etc., 1749)
Thomas Evans, New York City, 1749-1750 (7: December 18, etc., 1749)
Nicholas Barrington, Staten Island, New York City, 1752, 1755, 1757 (7: November 13, 1752)[15]
Richard Smith, New York City, 1749-50, 1753-57 (7: December 25, 1749)[16]
Mary Giles, New York City, 1749, 1761 (9: VI, 65)
James Giles, New York City, 1749, 1758-59, 1761-62 (9: VI, 65)[17]
William Wilson, New York City, 1750 (7: June 18, etc., 1750)
Gabriel Wayne, New York City, 1750 (7: July 30, etc., 1750)
Michael Knoll, New York City, 1750 (7: August 6, 1750)
Reinhold J. Klockhoff, New York City, 1751 (7: April 22, 1751)
Benjamin Leigh, New York City, 1751 (7: January 14, etc., 1751)
Edward Smith, New York City, 1751 (7: April 29, 1751)
Garrat Noel, New York City, 1751-53 (7: January 21, etc., 1751; 1, 177)
Robert Leeth, New York City, 1751-52, 1755 (14: May 27, 1751)[18]
John N. Hutchins, New York City, 1751-52, 1755, 1763, 1765, 1770, 1772 (1: 177)[19]
Rebecca Furman, New York City, 1752 (9: VI, 459)
John B. Guerbois, New York City, 1752 (7: November 6, 1752)
James Hutchins, New York City, 1752 (7: June 26, 1752)
John Lewis, New York City, 1753-54 (7: June 4, 1753 and other dates in that and the following year)
John L. Mayor, New York City, 1753-54 (7: November 26, 1753 and other dates in that and the following year)
William Elphinstone, New York City, 1753, 1755-56, 1758, 1760-61, 1763-66, 1775-76 (7: October 15, 1753 and other dates to Oct. 9, 1760)[20]
Jeremiah Owen, New York City, 1754 (9: V, 112)
Thomas Ross, New York City, 1754 (15: October 7, 1754)
John Cooper, Southampton, 1755 (9: V, 59)
..... Graham, Rumbout Precinct, Dutchess County, 1755 (15: May 19, 1755)
John Searson, New York City, 1755, 1757 (7: April 28, etc., 1755, May 16, etc., 1757)

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[15] S.P.G. teacher before 1752. *See also* 15: May 19, 1755; 7: May 29, etc., 1757.

[16] *See also* 9: V, 46; 7: April 23, etc., 1753, and a number of other dates to March 8, 1756)

[17] *See also* 7: March 27, etc., 1758; April 30, 1759; 15: September 7, 1761; 7: September 2, 1762.

[18] *See also* 7: June 17, 1751 and other dates until May 19, 1755.

[19] *See also* 9: VI, 147, 225, 266; VII, 434; VIII, 12; IX, 299. 7: May 13, 1751, June 26, etc., 1752. 15: May 12, 1755, and other dates in 1763 and 1765. 12: October 22, 1770, September 21, 1772)

[20] *See also* 15: June 22 and other dates in 1761, January 10 and other dates in 1763; 7: May 17, 1764; 15, February 4, 1765 and other dates in that and the following year; 10: August 31, 1775; 12: January 1, 1776.

James Wragg, New York City, 1755-1757 (**15**: February 17, 1755; **7**: April 7, 1755, and numerous dates in 1755, 1756, and 1757)
James Farrill, New York City, 1756 (**15**: July 12, etc., 1756)
Elizabeth Wragg, New York City, 1756 (**7**: April 5, etc., 1756)
John Thompson, New Windsor, 1756 (**16**: 387)
Luke Cummins, Hempstead, 1756 (**9**: V, 376)
Thomas Johnson, New York City, 1756, 1761-62 (**7**: May 10, etc., 1756; **15**: November 23, 1761)[21]
Gerard Smith, New York City, 1757 (**9**: VI, 340)
Thomas Clark, New York City, 1757 (**7**: May 2, etc., 1757)
William Penn, New York City, 1757-59 (**9**: V, 226)
Edward Willett, New York City, 1757-58, 1764 (**7**: October 24, 1757, August 14, 1758, March 29, 1764)
John Davis, Westchester, 1758 (**18**: 66, 76)
George Adams, New York City, 1758 (**7**: July 31, etc., 1758)
Nathaniel Havens, New York City, 1758 (**7**: May 8, etc., 1758)
William Wilson, Queens County, 1758 (**18**: 108)
Alexander Graham, Orange County, 1758 (**9**: V, 272)
Joseph Gibbs, Southampton, 1758 (**9**: V, 309)
Samuel Giles, New York City, 1758-59, 1761, 1763-64 (**7**: March 27, 1758 and other dates in that and the following year)[22]
John Wingfield, New York City, 1758, 1777 (**7**: October 23, etc., 1758; **12**: September 15, etc., 1777)
Samuel Moore, Phillipsburgh, Westchester County, 1759, 1763 (**18**: 182, 336; **9**: VIII, 9)
William German, Queens County, 1760 (**18**: 242)
John MacGie, Suffolk County, 1760 (**18**: 236)
Daniel Moor, Dutchess County, 1760 (**18**: 254)
John Wallas, Westchester County, 1760 (**18**: 316, 422 [John Wallis])
William Barker, Dutchess County, 1761 (**18**: 414)
John Chandler, Orange County, 1761 (**18**: 404)
Nathaniel McCaul, New York City, 1761 (**15**: September 21, 1761)
John Kean, Dutchess County, 1761 (**18**: 382)
William Rudge, New York City, 1761 (**15**: September 28, 1761)
Robert Butcher, Poughkeepsie, 1761 (**9**: VI, 123)
William Hanna, Albany, 1761 (**15**: November 23, 1761)
Calbe Huestis, North Castle, Westchester County, 1761 (**9**: VI, 319)
Samuel Bruce, New York City, 1761-63, 1765 (**9**: VI, 409)[23]
William Clajon, New York City, 1761, 1764, 1766 (**15**: January 26, etc., 1761; **7**: October 25, etc., 1764, January 2, etc., 1766)

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[21] *See also* **7**: January 18, 1762; **17**: May 17, 1762.

[22] *See also* **15**: September 7, etc., 1761, April 11, etc., 1763; **7**: April 12, etc., 1764.

[23] *See also* **15**: August 31, etc., 1761, April 4, 1763, May 13, 1765.

John Young, New York City, 1761, 1766, 1768, 1793 (1: 214)[24]
Frederick Rothenbuhler, New York City, 1762 (7: July 8, 1762)
Cornelius Cregier, New York City, 1762 (9: VII, 165)
Stephen Dwight, New York City, 1763 (15: May 2, 1763)
William Jones, New York City, 1763 (15: April 25, etc., 1763)
Alexander Leslie, New York City, 1763 (15: April 25, 1763)
Daniel Thane, Staten Island, 1763 (15: November 14, 1763)
Dunlap Adems, New York City, 1763 (15: January 10, etc., 1763)
George Harrie, Rye, 1763 (9: VI, 329)
William Cockburn, New York City, 1763-64 (15: December 5, 1763; 7: January 12, 1764)
Richard Fletcher, New York City, 1764-69 (9: VI, 437, VII, 299, VIII, 17)
William Adams, Coldenham, Harlem, 1764, 1766, 1770 (7: April 26, 1764)[25]
George Rynhard, Catsbaan, 1764-84 (9: VII, 375; 16: 195, 229, 275, 471)
Mary Bosworth, New York City, 1765 (15: May 20, 1765)
Peter Wilson, New York City, 1765 (15: April 22, 1765)
Richard Bunn, Rye, 1765 (19: 219)
James McCarrell, Newtown, 1765 (15: April 15, 1765)
Jeremiah Connor, Staten Island, 1765 (9: VII, 165)
Seth Moore, New York City, 1765 (9: VII, 25)
..... Jackson, New York City, 1765 (15: April 22, 1765)
Thomas Carroll, New York City, 1765-66 (15: May 6, etc., 1765 and dates in 1766)
Edward Riggs, New York City, 1765-66, 1783 (15: April 22, 1765, May 26, 1766; 20: November 20, 1783)
Godfrey Hains, Harrison's Purchase, Long Island, 1767 (19: 261)
George Murray, New York City, 1767 (7: June 18, etc., 1767)
William Hider, Staten Island, 1767 (9: VII, 464)
Hugh Hughes, New York City, 1767, 1771-72 (7: April 16, etc., 1767; 12: December 30, 1771, Jan. 6, etc., 1772)
George Meader, New York City, 1768 (9: VII, 466)
James Lamb, New York City, 1768, 1770 (7: December 12, 1768; 12: May 14, 1770)
Cornelius Van Velzor, Westchester County, 1769 (9: VII, 467)
Lewis Donovan, Woodbury Clove, Orange County, 1769 (9: VII, 359)
George Robinson, New York City, 1770 (12: January 1, etc., 1770)
James Carpenter, Goshen, 1770 (9: VII, 403)
Josiah Stoddard, Kingston, 1770 (12: October 22, etc., 1770)
Robert Pigot, Orange County, 1770 (16: 359)
Joseph Coddington, Shawangunk, Ulster County, 1770 (9: VII, 405)

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[24] *See also* 9: VII, 252, XIV, 130, 173, 222, 247; 7: April 9, 1761; 15: May 19, 1766.

[25] *See also* 15: April 14, 1766; 12: June 11, etc., 1770.

Stephen Van Voorhis, New York City, 1770 (1:229)
John Avery, Huntington, 1770 (9: VII, 341)
..... Hall, Canajoharie, 1770-71 (2: 112)
Jacob Tyler, New York City, 1770-75 (1: 230; 9: VIII, 374)
John McLeland, Canajoharie, 1770-82 (2:112)
Mary Pack, New York City, 1771 (12: April 22, etc., 1771)
John Bay, Albany, 1771 (9: VIII, 60; 19: 309)
Frederick John, Jamaica, 1771 (9: VII, 451, 457)
J. and M. Tanner, New York City, 1771, 1774 (12: January 14, etc., 1771; 10: February 24, etc., 1774)
James Gilliland, New York City, 1771-72, 1774-75 (12: May 27, 1771, December 14, 1772)[26]
James O'Brien, New York City, 1771, 1780 (12: May 6, etc., 1771, June 5, 1780)
John Bryan, Brooklyn, 1772 (9: VIII, 18)
James Duffie, Staten Island, 1772 (9: VIII, 38)
Samuel McCorkle, New York City, 1772 (12: December 21, 1772)
Terence Reilly, Staten Island, 1772 (9: VIII, 38)
John P. Tetard, Kings Bridge, 1772-73, 1775 (12: September 7, etc., 1772)[27]
J. Hughes, New York City, 1773 (10: October 21, etc., 1773)
Robert Gilmore, Westchester, 1773 (9: VIII, 359)
..... Austin, Albany, 1773 (10: April 29, 1773)
Alexander Miller, Schenectady, 1773 (10: November 4, etc., 1773)
Frances Brien, New York City, 1774 (12: March 14, 1774)
John Addison, Kingston, 1774 (10: May 5, etc., 1774; 22: X, 75)
John Ostrander, Albany, 1774 (9: IX, 285)
Thomas Byerley, New York City, 1774 (10: February 17 etc., 1774; 21: February 17, etc., 1774)
Josiah Day, New York City, 1774 (10: February 17, etc., 1774; 21: February 17, 1774)
Daniel Hamill, Dutchess County, 1774 (9: VIII, 349)
George Shannon, New York City, 1774 (9: VIII, 373)
S. and C. Lugrin, New York City, 1774 (10: April 21, 1774)
John Copp, Flatbush, 1774 (10: July 7, 1774)
David Monell, Hanover, Ulster County, 1774 (9: VIII, 265)
..... Gollen, New York City, 1774 (10: October 6, 1774)
..... Mountain, New York City, 1774 (10: October 6, 1774)
William Horton, Phillipsburgh, Westchester County, 1774 (9: VIII, 259)
W. Long and S. Long, New York City, 1774-75 (10: January 27, etc., 1774, November 2, 1775; 21: January 27, 1774)
Mrs. Joseph Cozani, New York City, 1774-75 (10: July 21, 1774, April 20, etc., 1775)

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[26] *See also*, 1, 237; 10, January 12, 1775.
[27] *See also* 21: February 17, 1774; 10: June 1, etc., 1775.

Samuel Seabury, Westchester, 1775 (**10**: March 16, 1775)
Du Poke and De St. Pry, New York City, 1775 (**10**: March 23, 1775)
Francis Vandale, New York City, 1775 (**10**: October 26, etc., 1775)
John Campbell, Orange County, 1775 (**16**: 78)
Cornelly Ferran, Goshen, 1775 (**23**: XV, 116)
Robert Frayer, Orange County, 1775 (**23**: XV, 169)
Thomas Hart, Goshen, 1775 (**23**: XV, 170)
James Howard, Goshen, 1775 (**23**: XV, 167)
..... Rose, Johnstown, 1775 (**4**: 207)
Owen Madden, Shawangunk, 1775 (**23**: XV, 171)

Although this list contains two hundred names, my research has not been exhaustive. There must be more schools which belong to such a list. My collection for this period including masters of Dutch and French schools contains two hundred and fifty names. In this article I have assumed that "an English school" was one in which the English language was used in teaching the fundamental subjects. Many English schools of this period offered foreign languages for cultural and vocational purposes.

What remains to be said? This is but one of the many errors that have been perpetuated in the accounts of early American education. The danger lies in the probability that the student will be no more critical than his text.

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6. *Liber 29, Ms.* Folio in Library of New York Historical Society.
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number 7. (1730, 1731, 1732, 1744, 1747, 1748, 1749, 1750, 1751, 1752, 1753, 1754, 1755, 1756, 1757, 1758, 1760, 1762, 1764, 1766, 1767, 1768)
8. *New York Weekly Journal.* (1733, 1737, 1740, 1741)
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14. *New York Evening Post.* (1747, 1751)
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16. *Calendar of Wills, 1626-1836.* B. Fernow, editor, 1896.
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Editorials

PROFESSIONAL TRAINING

That teaching is a profession is often debated. Strong arguments are presented to show that the teaching group lacks some of the essential features which characterize a profession. A lack of solidarity, which makes possible effective group action, is sometimes pointed out. A lack of permanency is often deplored, for the average length of teachers' service is only about five years.

Whether teaching be a profession or not has no bearing on the point which we wish to consider. The fact remains that attendance at technical schools of education whether termed normal schools, teachers' colleges, or colleges of education is growing rapidly. This is especially true of the summer session, when all ranks of the teaching group—kindergartners, elementary teachers, junior high-school teachers, high-school teachers, principals, superintendents, business managers, and even members of boards of education are crowding in for short periods of specific training. Whether this attendance will help to create a profession remains to be seen. It is too early definitely to foresee the outcome.

About half the present scholastic year has passed, but many teachers are already making their plans for the coming summer. Even now college catalogues are being scanned and the relative offerings of various institutions considered from the standpoint of individual needs. This is well and we hope that in some way we may assist in this most desirable movement.

We would like, however, to present for thoughtful consideration the possibility of attendance not only during the coming summer but for a longer period. Young men, especially those who are looking forward to a life of service in education, should

consider the advisability of spending not only next summer but all of next year in some excellent professional school. They need to give serious consideration to the essential qualifications for success in education. They should examine themselves most critically to ascertain whether or not they personally possess these essential characteristics.

No young man should aspire to a permanent place in educational work who does not at the same time foresee for himself a marked measure of success. Educational work should not be considered an easy berth to a life of mediocrity. He who is looking forward to a professional career should determine whether or not he possesses superior ability, both mental and social. If he is to keep pace with the growth of the science of education he must be able mentally to keep pace with thinkers in the field. If he expects to be a success in leading children to think, he must be capable of constructive thought, of more than parrot repetition. If he hopes to rise to a position of large responsibility, he must possess social intelligence which will enable him to interpret his community and adjust himself to the changing social order. To these qualifications he should add a genuine love for children and a devotion to service. Love of books is not sufficient, for the teacher's fundamental function is neither to know books nor to teach books but to know and to teach children.

This rising tide of attendance also entails an obligation upon these professional schools. The obligation does not consist nearly so much in providing buildings and equipment as in providing a teaching personnel characterized by a professional attitude. These schools must do two things if they are to rise fully to the opportunity which this increased attendance offers. They must keep sympathetically in touch with real situations, and they must have each year fresh evidence concerning school problems and their solution. To meet the first requirement, the teaching force of our professional schools must do more than simply teach college students. They must get personally into school classrooms, preferably public-school classrooms. They must meet boards of

education in a professional way. They must see the problems of teachers, principals, and superintendents as those problems appear in actual situations. No amount of reading the reports of others, or abstract thinking about the problem will make a satisfactory substitute for this personal contact. Only as the teachers in our professional schools can demonstrate to their students a practical familiarity with actual school problems will they be able to command the respect and confidence which is essential. They must also maintain an experimental attitude toward educational problems. These students come from their personal contact with problems in their own locality to the professional school legitimately expecting to learn new truths which have a bearing upon their specific difficulties. They will soon discover and cease to attend that institution the members of whose faculty have not made some contribution to the solution of educational problems and who do not have some new evidence to offer which promises at least a little assistance in the work of the day.

There is no question about the attitude of large numbers of teachers, supervisors, and administrators toward professional work. The challenge, however, is twofold: To the professional schools that they guarantee dynamic offerings, and to the teachers that they utilize largely the opportunities which the professional schools offer.

E. J. A.

Reviews and Abstracts

REEDER, WARD G. *How to Write a Thesis.* Bloomington, Illinois, Public School Publishing Company, 1925. 136 pp.

Every graduate student I have ever had would have profited immensely, in the preparation of his thesis, by reading this little book. On a few of its smaller points I do not agree. I should not let a blank in the table represent—at least not under all circumstances—"no data." I should not give the same meaning to "bar chart" that the author does. I should not make the same distinction between *percent* and *percentage*. But these are trivialities and debatable. The author is as likely to be right as I. On all the big points—on every count that really matters—Dr. Reeder has produced a manual which every university man who supervises theses should bring to the attention of his graduate students. It will save his time and it will save theirs. In any given case it will settle many questions outside of the conference hour. It will thus release energy for the more vital aspects of the thesis problem.

Here are some of the points on which the book will throw light: how to set up tables of several kinds; how to place and arrange footnotes (tabular, bibliographical, and explanatory); how to make a table of contents; how to set up topical headings of different levels of subordination; how to make up questionnaires; how to proofread; and how to make up some of the most serviceable graphs such as line and bar drawings, component bars and circles, histograms, maps, organization charts, scatter diagrams, and the like.

It is true that these are not profound matters. They are, however, essential; and they facilitate, as Dr. Reeder points out, the handling of more fundamental aspects of the thesis problem. One is reminded here of the fine section in the manual on the necessity for good English. The author calls for accuracy, clarity, and charm. He defines the first two at some length. He then concludes that charm—which he defines as the essence of the courage, sunshine, and zest reflected "between the lines" from the author to the reader—will be sufficient for thesis purposes if accuracy and clarity are secured. Just as charm is subserved by humbler qualities such as clarity and accuracy, so in making and reporting an original investigation the thing-in-itself is made measurably attainable by attention to these formal matters.

It is of inestimable value to have an authoritative statement of these matters in a form so clear that its meaning cannot be escaped and so compact that the book may be easily carried about in one's pocket.

Ohio State University B. R. BUCKINGHAM

UHL, WILLIS L. *Principles of Secondary Education.* New York, Silver, Burdette Company, 1925. 692 pp.

This volume contains a collection of readings in the field of secondary education and a summary of the important principles and conclusions formulated in these readings. At the close of each chapter there are suggestions for discussion with extended bibliographical notes. The readings are drawn from textbooks as well as from the literature in periodicals. The author has done more than merely assemble a collection of readings, which would be a splendid task in itself, and a kind of work that is needed in many fields of education. In this book, however, the author has supplemented the readings with questions for discussions, an analysis of readings, and valuable bibliographies for more extended investigations. The bibliographies are especially valuable because much of the recent literature is included.

The book is divided into six parts and each part consists of from one to four chapters. The titles of these six parts define the range of the material in the book. These are: Part I, The American Plan for Secondary Education; Part II, The Secondary-School Teacher; Part III, Secondary-School Pupils; Part IV, Secondary Education in Foreign Countries; Part V, The Reorganization Movement in Secondary Education; Part VI, Curriculum Problems. Examining the discussion included in any one of the chapters one finds the commendable practice of presenting conflicting views on many issues. This is well illustrated in chapter VIII entitled "The Mental Equipment of Secondary-School Pupils." In this chapter the author has included articles by eight different writers, and even casual reading reveals the differences of opinion expressed by these writers.

The book should prove a time-saving text for both instructors and students, since it makes accessible a large amount of educational literature that would otherwise be inaccessible except to those having command of a complete educational library. This book should also serve another important purpose in making available for teachers and administrators in the field a considerable amount of the best literature on general issues in the field of secondary education. The author is to be commended for the excellent judgment he has shown in his selection of readings and for his skill in so organizing the book as to make it a useful volume in the classroom.

J. B. EDMONSON

University of Michigan

ROSS, CLAY C. *The Relation between Grade-School Record and High-School Achievement. A Study of the Diagnostic Value of Individual Record Cards.* New York, Teachers College, Columbia University, 1925. 70 pp. (Teachers College, Columbia University, Contributions to Education, No. 166)

In the discussion of this problem two major questions are propounded: What is the relation between a pupil's grade-school record and his success in high school? and What is the relation between a pupil's grade-school record and his length of stay in the high school? Each of these questions is resolved into

several questions which offer specific points of attack. Mr. Ross admits that so much has been written concerning the fallibility of teachers' marks that they seem to have come into general disrepute. Yet he finds in them a unique value. He points out that, although teachers may disagree as to the absolute value of a pupil's effort in an examination, they can rate him with reasonable accuracy as poor, average, good, or excellent. Since, by the time a pupil has finished the grade schools, his card contains the ratings of several teachers, these ratings constitute a group judgment. Mr. Ross defends the value of such a judgment in predicting future school success. He notes a higher correlation between teachers' marks and success than between intelligence scores and success. He suggests as an explanation that teachers' marks may possibly be the very things that take account of the non-intellectual factors in success, such as habits of indolence or industry.

The technique employed in this study is entirely statistical, and these conclusions are reached:

> The best basis for predicting high-school achievement would seem to be a combination of the following: (1) intelligence-test ratings which would afford a measure of the pupil's native endowment; (2) ratings on standard achievement tests, which would afford objective evidence as to the pupil's prerequisite academic preparation, and which would make possible ready comparisons between teachers and different schools; and (3) teachers' ratings in the grade school, which afford a measure of the pupil's attitudes and habits of character, such as industry, persistence, and conscientiousness, already acquired, factors which have been reflected in the grade-school record, and which will always be very important in determining an individual's success in school and out of school.

HARLAN C. KOCH

Ohio State University

CONSULTATIVE COMMITTEE. *Psychological Tests of Educable Capacity.* Report of the Consultative Committee of the Board of Education, London. London, H. M. S. Stationery Office, 1924. 250 pp.

In July, 1920, the Board of Education for England referred to its Consultative Committee, composed of such eminent educators as Sir W. H. Hadow, Dr. Adami, Lord Gorell, and Dr. Ernest Barker, the problem, "What use can be made in the public system of education of psychological tests of educable capacity?" The Committee interpreted this reference in broad terms, including under "psychological tests of educable capacity" individual and group intelligence tests, educational tests, vocational tests, sensori-motor tests, tests of special mental processes and of character and temperament.

The opening chapter by Dr. Cyril Burt is an historical sketch of the development of psychological tests. He reviews the pioneer efforts of Galton and Cattell in measuring mental abilities by sensori-motor tests, and the demonstration of their inadequacy by Thorndike and Wissler. Burt attributes the revival of interest in intelligence testing to three factors, the standardization of a method of "oral interview" by Binet, the contribution of an adequate statistical method by Spearman, and the deductive approach to the nature of com-

plex processes by Ebbinghaus. The chapter is well annotated and is perhaps the most interesting section of the book to professional readers.

Chapter II is a summary of the evidence obtained by the Committee. The theory of intelligence, the assumptions in intelligence testing, the advantages and difficulties of a number of the revisions of the Binet scale, the relative values of group and individual tests, are treated schematically but impartially. The third chapter is of more local than general interest, inasmuch as it considers the possible uses of intelligence tests in English public and private schools. The Committee recommends the use of group intelligence tests in grading secondary-school pupils, and in awarding "free places" but contends that no reliable group tests are available for children under ten years of age. It does not consider the vocational tests of the type now available, the physical tests, or the tests of special abilities or of character sufficiently well standardized or validated to warrant general use at the present time. The Committee recommends that teachers be trained to use tests of educable capacity, and that a Central Bureau be established to conduct experimentation in the use and construction of tests.

The appendices contain brief summaries of experiments in the use of intelligence tests in English private and public schools, a brief historical and descriptive survey of the progress of intelligence and vocational testing in various countries, an adequate bibliography, and samples of tests.

The report is well conceived and well executed. If it can be taken as a fair index of British professional opinion, we may expect significant contributions within the next few years from the land of the great pioneer Galton.

E. D. McPhee

University of Toronto

Pittenger, Benjamin F. *An Introduction to Public-School Finance*. Boston, Houghton Mifflin Company, 1925. 372 pp.

The problem of obtaining adequate sums of money for the public schools is one of the most important with which educational authorities are now confronted. The difficulty of the situation is magnified by the fact that the costs of public business of all kinds have been increasing at an alarming rate and existing methods of taxation are causing widespread dissatisfaction. Hasty or radical efforts at reform cannot improve the situation. What is needed most at the present time is a patient and thorough study of the problem.

With a view to facilitating such a study, *An Introduction to Public-School Finance* has been prepared. The author presents in this volume an outline of the major problems of school finance and describes the state of practice and opinion with reference to the numerous topics which are included therein. The work is arranged in four divisions. The first two chapters describe the significance of the problem. Part I, the largest division, is concerned with the local problem and takes up the following topics: the budget, comparative costs, financial records and accounts, indebtedness, responsibility for control of finances, and publicity and finances. In Part II the question is considered

from the standpoint of the state, and attention is given to educational inequality, units of support, and apportionment of funds. The final chapter is devoted to sources of revenue, how to make them available, and the nature and size of the demand that should be made upon each.

The subject is treated in a simple non-technical way which should make it profitable reading for persons who may have a general interest in the subject as well as for the students of educational administration. The author is careful to present both sides of controversial questions and includes many quotations from the reports of influential and scientific bodies that have studied various aspects of the problem. A well-selected, annotated bibliography appears at the end of each chapter, and lists of topics for further investigation and discussion are provided for the encouragement of students, stimulating them to think in an analytical way concerning local financial situations with which they are familiar. Throughout the work the author is chiefly interested in the practical difficulties that confront local boards and superintendents of schools. Such a book is much needed and will prove especially useful to teachers of education who are responsible for training the on-coming generation of school administrative officers.

PAUL W. TERRY

University of North Carolina

BARR, A. S. AND OTHERS. *Elementary-School Standards for the Improvement of Teaching.* Ann Arbor, Edwards Brothers, 1924. 159 pp.

The author states in his Preface that this material has three definite practical purposes:

(1) To set up concisely standards of practice for the assistance of principals in their efforts to improve instruction; (2) to state concretely the characteristics of good teaching for the guidance of teachers in their efforts to improve themselves; and (3) to list specifically elementary-school practices in order that our own notions of what constitutes good teaching may be clarified.

He further states in his Introduction that the situations in the field of supervision which have developed the need for standards are: (1) The ideas, practices, and scientific discoveries in education are now scattered. (2) There is a growing tendency to make the elementary-school principal responsible for instruction. (3) The present standards for judging the quality of instruction are highly subjective.

Mr. Barr and his associates on the supervisory force of Detroit endeavored to meet these situations by bringing together in each of fourteen subject-matter fields the references which would best assist principals and teachers in improving instruction; by setting up specific practices and objectives which are conceded to be desirable; and by raising explicit questions regarding facts, practices, and activities which may be observed by a supervisor when visiting a classroom. Each subject field has been analyzed so that a number of pages are given to items for supervisory observation. It is not expected that all of these items will be observed at one time, nor need they all be presented during a single period.

The author states that "the items here reported may be regarded as the raw materials from which standard items to observe may be derived." Certainly any supervisor, principal, or teacher who consciously considers the questions raised by this volume will have a clearer conception of the activity that is taking place in the classroom than if an attempt is made to evaluate in general terms only.

It seems that the purposes set forth in the Preface have been consistently kept in mind and fairly well achieved. The volume should function wholesomely in the hands of conscientious school people whether they have to do with instruction from the standpoint of the teacher, the principal, or the supervisor.

E. J. ASHBAUGH

Ohio State University

Publications Received, November 15 to December 15

Aitchison, A. E., and Uttley, Marguerite. *Across seven seas to seven continents.* Indianapolis, Ind., Bobbs-Merrill, 1925. 304 pp. $1.50.

Aldredge, E. M., and McKee, J. F. *Friendly folks to read-draw-color; for second and third grades.* Cleveland, Ohio, Harter School Supply Co., 1925. Per set, $.50.

Bagley, W. C. *Determinism in education: a series of papers on the relative influence of inherited and acquired traits in determining intelligence, achievement, and character.* Baltimore, Warwick & York, 1925. 194 pp. $2.20.

Blackhurst, J. H. *Directed observation and supervised teaching.* Boston, Ginn, 1925. 420 pp. $1.80.

Branom, M. E. *The Branom practice tests in geography.* New York, Macmillan, 1925. 255 pp. $.80.

Bruno, G. *Le tour de la france par deux enfants.* Ed. by F. B. Wilson. New York, American Bk. Co., 1925. 398 pp. $.96.

Burke, Edmund. *Selections.* Ed. by L. N. Broughton. New York, Scribner, 1925. 469 pp.

Chamberlain, J. F., and Chamberlain, A. H. *Africa, a supplementary geography.* New York, Macmillan, 1925. 206 pp. $.96.

Children's primary school book. New York, Ethical Culture School, 1925. 77 pp. $.75.

Crawford, R. P. *These fifty years: a history of the college of agriculture of the University of Nebraska.* Lincoln, Nebr., College of Agriculture, Univ. of Nebraska, 1925. 175 pp.

Cromie, W. J. *Gymnastics in education.* Philadelphia, Lea & Febiger, 1925. 220 pp. $3.75.

Darrow, F. L. *Thinkers and doers.* New York, Silver Burdett, 1925. 378 pp. $1.16.

Delano, J. A. *American Red Cross textbook on home hygiene and care of the sick.* 3rd ed. rev. Philadelphia, Blakiston, 1925. 347 pp. Cloth, $1.50. Paper, $.85.

Domino and figure combinations. Cleveland, Ohio, Harter School Supply Co., 1924. Per set, $.40.

Down on the farm. Cleveland, Ohio, Harter School Supply Co., n.d. Per set, $.30.

Drummond, A. M. *A course of study in speech training and public speaking for secondary schools.* New York, Century, 1925. 291 pp. $1.25.

Eaton, Mary. *Consider the child; for students in training.* New York, Longmans, Green, 1925. 256 pp. $1.50.

Foote, J. M. ed. *The man without a country and other patriotic stories.* Philadelphia, Winston, 1925. 266 pp. $.60.

France, Anatole. *La buche.* Adapted for schools by V. F. Boyson. London, Oxford Univ. Press, 1925. 94 pp. $.50.

Friese, J. F., and others. *Manual arts in the junior high school.* St. Cloud, Minn., Board of Education, 1925. 301 pp. $1.75.

Goldstein, Mabel. *Elliptical stories.* Cleveland, Ohio, Harter School Supply Co., 1924. Per set, $.40.

Hall, A. N. *Outdoor boy craftsmen.* Boston, Lothrop, 1925. 429 pp. $2.50.

Hallock, G. T. *Dramatizing child health.* New York, Am. Child Health Assn., 1925. 306 pp. $2.00.

Harrison, J. E. *Mythology.* Boston, Marshall Jones, 1924. 155 pp. $1.50.

Hart, I. B. *An introduction to physical science.* Oxford, Clarendon Press, 1925. 306 pp. $1.50.

Harter's inch high letter cards. Cleveland, Ohio, Harter School Supply Co., n.d. Per box, $.25.

Harvey, E. B., and Allen, R. F. *The mastery of English; book one.* Philadelphia, Winston, 1925. 449 pp. $1.11.

Hauch, E. F. *German grammar for beginners with drill exercises.* New York, Oxford Univ. Press, 1925. 184 pp. $.95.

Heath, H. C. *A laboratory manual for elementary college biology.* Ann Arbor, Mich., Edwards Bros., 1924. 34 pp. $.50.

Hildreth, G. H. *The resemblance of siblings in intelligence and achievement.* New York, Teachers College, Columbia University, 1925. 65 pp. (Contributions to education, No. 186) Cloth, $1.50. Paper, $1.25.

Hillbrand, E. K. *What every student ought to know; a handbook for high-school and college students.* Ann Arbor, Mich., Edwards Bros., 1925. 61 pp. $1.25.

Hillegas, M. B., and others. *Horace Mann supplementary arithmetic, diagnostic and corrective.* Philadelphia, Lippincott, 1925. 156 pp. $.60.

Hillegas, M. B. *Teaching number fundamentals; to accompany the Horace Mann supplementary arithmetic.* Philadelphia, Lippincott, 1925. 98 pp. $1.20.

Howell, L. D., and Williams, F. S. *The new Howell primer for foreign children.* New York, Noble, 1925. 128 pp. $.50.

Hudson, W. H. *Far away and long ago; a history of my early life.* New York, Dutton, 1925. 332 pp. $1.10.

Hunter, E. B. *Modern filing manual.* 2nd ed. Rochester, N. Y., Yawman & Erbe, 1925. 254 pp. $3.00.

Irion, T. W. H. *Comprehension difficulties of ninth grade students in the study of literature.* New York, Teachers College, Columbia University, 1925. 116 pp. (Contributions to education, No. 189) Cloth, $1.50. Paper, $1.25.

McMurry, K. C., and Hall, R. B. *Source book in the geography of commercial production.* Ann Arbor, Mich., Edwards Bros., 1925. 334 pp. $3.00.

Moore, J. S. *The foundations of psychology.* Princeton, N. J., Princeton Univ. Press, 1924. 239 pp. $3.00.

Myers, G. C. *Reading and writing numbers; for third and fourth grades.* Cleveland, Ohio, Harter School Supply Co., 1925. Also diagnostic testing pad. Per pad, $.20.

My life work. Milwaukee, Wis., Milwaukee Vocational School, 1925. Metal trades series. No. 1, The molder and the coremaker. No. 2, The pattern-maker. No. 3, The machinist. No. 4, The tool and diemaker. No. 5, The draftsman. No. 6, The sheet-metal worker. No. 7, The forgeman. No. 8, The welder. No. 9, The boilermaker. Building trades series. No. 1, The carpenter. No. 2, The bricklayer. No. 3, The plumber. No. 4, The electrician. No. 5, The painter and decorator. No. 7, The plasterer. $.15 each.

Neale, O. W. *Picture study in the grades.* Stevens Point, Wis., O. W. Neale Pub. Co., 1925. 447 pp. $2.40.

Paine, W. L., and Mainwaring, C. L. *Primus annus.* 2nd ed. Oxford, Clarendon Press, 1925. 176 pp. $.95.

Pennsylvania. University. School of Education. *Twelfth annual schoolmen's week proceedings, March 26-28, 1925.* Philadelphia, Press of the Univ. of Pennsylvania, 1925. 404 pp.

Philippe, C. L. *Enfants et petites gens.* Ed. by Hélène Harvitt and W. C. Doub-Kerr. New York, Oxford Univ. Press, 1925. 244 pp. $1.10.

Playground and Recreation Association of America. *The normal course in play.* New York, A. S. Barnes, 1925. 261 pp. $2.00.

Plays and pageants for children. Selected and arranged by M. A. Whiting. Boston, Educational Pub. Co., 1925. Vol. I. $1.50.

Proctor, W. M. *Educational and vocational guidance.* Boston, Houghton Mifflin, 1925. 352 pp. $2.00.

Ridgley, D. C. *Geography principles; their application to the elementary school.* Boston, Houghton Mifflin, 1925. 189 pp. $1.20.

Rosen, E. K. *A comparison of the intellectual and educational status of neurotic and normal children in public schools.* New York, Teachers College, Columbia University, 1925. 51 pp. (Contributions to education, No. 188) Cloth, $1.50. Paper, $1.25.

Schultze, Arthur, and Breckenridge, W. E. *Elementary and intermediate algebra.* New York, Macmillan, 1925. 461 pp. $1.60.

Short stories for class reading. Ed. by R. P. Boas and B. M. Hahn. New York, Holt, 1925. 365 pp. $1.20.

The silent teacher of subtraction. Cleveland, Ohio, Harter School Supply Co., 1924. Per set, $.60.

The silent teacher of vocabulary building. Cleveland, Ohio, Harter School Supply Co., 1924. Per set, $.60.

Spyri, Johanna. *Jorli: the story of a Swiss boy.* Trans. by F. T. Clayton and Olga Wunderli. New York, Sanborn, 1925. 111 pp. $.52.

Stearns, A. E., and others. *The education of the modern boy.* Boston, Small, Maynard, 1925. 271 pp. $3.00.

Stone, J. C. *The Stone arithmetic; teachers' manual, grades one to six.* New York, Sanborn, 1925. 205 pp. $1.50.

Stormzand, M. J. *American history teaching and testing.* New York, Macmillan, 1925. 181 pp. $.80.

Ullman, B. L., and Henry, N. E. *Second Latin book.* New York, Macmillan, 1925. 508 pp. $1.68.

Vocational Service for Juniors. comp. *Opportunities for vocational training in New York City.* New York, The Author, 1925. 181 pp. $1.00.

Winch, W. H. *Teaching beginners to read in England: its method, results, and psychological bases.* Bloomington, Ill., Public School Pub. Co., 1925. 185 pp. (Journal of educational research monographs, No. 8) $1.25.

Wood, T. D., and Rowell, H. G. *Health through prevention and control of diseases.* Yonkers-on-Hudson, N. Y., World Book Co., 1925. 122 pp. $1.00.

Woodring, M. N. *A study of the quality of English in Latin translations.* New York, Teachers College, Columbia University, 1925. 84 pp. (Contributions to education, No. 187) Cloth, $1.50. Paper, $1.25.

Worst, E. F. *Worst's alphabet matching cards.* Chicago, Flanagan, 1925. Per envelope, $.25.

Worst, E. F. *Checker board number cards; for primary grades.* Chicago, Flanagan, 1925. Per envelope, $.30.

Worst, E. F. *Worst's multiplication drill cards.* Chicago, Flanagan, 1925. Per envelope, $.25.

Worst, E. F. *Worst's number drill cards; for primary grades.* Chicago, Flanagan, 1925. Per envelope, $.20.

Wylie, A. T. *The opposites test.* New York, Teachers College, Columbia University, 1925. 94 pp. (Contributions to education, No. 170) Cloth, $1.50. Paper, $1.25.

News Items and Communications

This department will contain news items regarding research workers and their activities. It will also serve as a clearing house for more formal communications on similar topics, preferably of not more than five hundred words. These communications will be printed over the signatures of the authors. Address all correspondence concerning this department to Doctor E. J. Ashbaugh, Ohio State University, Columbus, Ohio.

The Joint Legislative Committee on Economy and Taxation of the Ohio State Legislature has requested and subsidized the Department of School Administration, Ohio State University, to investigate certain school administrative problems. Professors C. C. McCracken, J. Cayce Morrison, and Ward G. Reeder will collaborate on these problems. Their report was ready for the Joint Legislative Committee February 1, 1926.

Superintendent Bonner Frizzell of Palestine, Texas, utilized the program of the formal opening of the new junior high school to give the people of the community considerable information regarding the growth of the school and its financial conditions. This is another means by which school people may bring important educational information to the attention of patrons.

The Division of College and University Personnel of the American Council on Education is developing rapidly in its service to education and educators in this country. Last year four hundred forty calls were received for teachers in requests which ranged from part-time instructorships to college presidencies. All graduate students preparing to teach in colleges and all college teachers even though they are now located and not anticipating a change are requested to register.

The Chicago Principals' Club (Service Bulletin No. 1) has recently reported by schools the percent of failures at the end of the first semester of 1924-25. The range was from zero percent to 35.2 with a median of 9.1. Two-thirds of the schools had percents between 7.5 and 13.0 and one-half between 8.5 and 12.0. The unstable conditions in the city of Chicago warrant a great variation in the percent of failure. The purpose of the bulletin is not to declare any percent wrong but "to inform each principal as to the relative placement of his school and to challenge the principal's own thought and attention on why his school is where it is."

The Public School Publishing Company is constantly adding to its extensive list of tests in the elementary and secondary field. Among the latest to

appear is one called, Information Exercises in Biology by J. L. Cooprider, of Central High School, Evansville, Indiana. The test consists of six groups of exercises which include: completion, true-false, best-reason, multiple-choice, and logical-selection tests. These exercises are intended to furnish the probable biological information possessed by the classes at the beginning of the year, to check the progress made by the pupils during the course, and to procure an objective score which may supplement the judgment of the teacher. Although a non-timed test, it is designed to be administered in a forty-minute period.

The School of Education, at the University of Pennsylvania, issued recently the printed report of its Twelfth Annual Schoolmen's Week. Reports of these conventions have been putting in their annual appearance so long that we have begun to take them as a matter of course. The papers presented in the general session and in the departmental meetings of the twelfth convention were of the usual excellence. Because such a series of reports becomes increasingly valuable year by year, the latest issue derives its importance not only from its contents but also from its relation to the series—a relationship which is increasing in significance. We hope these Pennsylvania publications will continue, since each year will add to their value as historical material.

"Centralization or Consolidation of Schools in Ohio," is the title of a four-page folder prepared by George M. Morris, rural-school supervisor, and published by the State Department of Education.

Tabulated by counties the data include the number of centralized and of consolidated schools, the number of pupils transported with the cost of transportation, the number of one-room schools in 1914 and in 1924, with the number of pupils attending one-room schools in 1924. The totals for the state show during the ten-year period, 3,967 one-room schools were closed, and many teachers were thus released.

The folder reports that three counties in the state have no one-room schools and that there are fewer than twenty-five in fifteen counties. It shows also that twenty-five counties can give no acceptable reasons for not consolidating, although many other counties are handicapped by hills, poor roads, and insufficient wealth.

The unusual work which the Milwaukee Vocational School is doing is shown in the publication of a series of sixty studies concerning the principal occupations in that city. Under the title "My Life Work," each study appears in a separate form attractively printed and illustrated. Nine studies in the metal trades' series and six in the building trades' series have been received. The monographs have been prepared by Harry S. Bellman under the direction of Robert H. Rogers, chief of the division of Vocational Teacher Training and Research of the vocational school. These occupational studies are written to give "information and guidance to the students in their adjustment to life's work. They should also be of practical value to teachers, parents, and counselors who are confronted with the problems of vocational and educational guidance."

In a recent circular (No. 117) the New Hampshire State Board of Education gives interesting data for secondary schools of the state for the year 1924-25. It shows that boys constitute 48 percent of the enrollment, that 13 percent of the pupils left school during the year, 10 percent failed in one course, approximately the same number failed in more than one course, and that the graduates were 50 percent of the number who had, four years previously, entered grade nine. Comparative figures for the last ten years showed large increases in enrollment, in the number of graduates, and in the percent of graduates of the preceding year who entered collegiate institutions, while the number of pupils per teacher and the percent failing one or more courses remained practically constant. A table shows at least sixty different subjects offered in one or more high schools in the state with the number of pupils enrolled for each subject. English, of course, stood first in total enrollment, with French, Latin, history and civics, elementary science, and algebra following in order. Sociology with three students, Italian with four, and psychology with seventeen, represent the other extreme.

The Chinese Society of Educational Research

The Chinese students, at Teachers College, Columbia University, have recently addressed themselves to organizing the Chinese Society of Educational Research, for the purpose of encouraging the scientific research in education in China. There is now a more urgent need of scientific research in the field of education in China than ever before. With her vast population and with a problem so intricate as education, a single organization like the Chinese National Association for the Advancement of Education, Peking, is not able to cope alone with such a Herculean task.

It is to answer such a challenge that the Chinese Society of Educational Research has made its appearance. A vast membership campaign is being launched to all distinguished Chinese scholars interested in education at home and abroad.

To summarize briefly the aims of the Society, the following four points may be enumerated:

1. *The pragmatic purpose.*—The Society will emphasize practical efforts to solve the present-day educational problems in China.
2. *The scientific methods.*—The Society will stress quantitative as well as qualitative evidences, objective standards, statistical data, and experimental findings in the research work.
3. *The indigenous material.*—The Society will utilize as much material available in China as possible. Foreign materials will also be used to cast light when desirable.
4. *The creative spirit.*—The Society will endeavor to stimulate originality and creativeness in research work.

The Providence Personnel Chart[1] is a clever device for showing graphically the relations of chronological age, mental age, intelligence quotient, educational quotient, and educational age within any class of pupils and the educational implications dependent upon these relations, for the class as a whole

[1] Published by J. B. Lippincott Company.

and for each individual pupil within the class. According to Richard D. Allen, the author, the following information concerning the group may be gathered immediately from the chart: (1) the ability, whether homogeneous or diversified, the social development, the rate of learning, and the degree of the diversity; (2) the general or median ability and learning rate of the group; and (3) the number and identity of pupils not educationally adjusted to their ages and abilities with indications of the probable course to be followed in making adjustment. By its use a teacher, principal, or supervisor may determine at a glance the pupil who is seriously out of adjustment in his class group, the quality of the class as a whole, and a comparison of the work which a pupil is doing with the quality and quantity of work which he should be able to do. It also furnishes a means for comparing different classes in the same grade or classes in different grades.

The standing of an entire class can be shown on a single chart without losing the identity of the individual pupils.

In short, the chart, when properly filled out, gives a composite record of *all* the factors which commonly influence the success or failure of pupils in school and which should be considered in any guidance program based on measurements. It is designed to avoid the errors of judgments based on the ordinary scatter-diagram which takes account of only two of the factors affecting any given situation.

The chart is somewhat similar in purpose and method of functioning to the Q-Score Table and Score Sheet of the Trenton, New Jersey, Bureau of Educational Research and Efficiency. The latter is larger, more comprehensive in the number of facts shown, and somewhat more definite in the exact placement of pupils. It also provides for recording the scores of several classes on the same sheet for comparative purposes or for recording the scores of all the pupils in a given grade throughout an entire school system.

On the other hand, The Providence Personnel Chart has several advantages. Being much smaller in size and, therefore, more convenient to handle, it is simpler to use and read and is applicable to any grade. Having guides for making proper adjustments, which cover all the essential data for intelligent guidance with placement of scores, it is probably sufficiently exact for most practical purposes.

Q-Score Table and Score Sheets for Grades X, XI, and XII

The Department of Educational Research and Efficiency of the public schools at Trenton, New Jersey, has recently produced an interesting, and seemingly practical, device for recording a great amount of test data in convenient form on a single sheet about fifteen inches square. It is called a "Q-Score Table and Score Sheet." By Q-Scores are meant the intelligent quotient (I.Q.), educational quotient (E.Q.), and achievement quotient (A.Q.).

When the chronological, mental, and educational ages are known, all the Q-scores can be found directly from the chart without computation. When the intelligence quotient, efficiency quotient, and achievement quotient, and scores for a class have been found and entered on the chart, it contains readily accessible information either in tabular or graphic form, as follows:

1. The I.Q., E.Q., and A.Q., for each pupil and for the class.
2. The I.Q., E.Q., and A.Q., grade status for each pupil and for the class.
3. The chronological age (C.A.), mental age (M.A.), and educational age (E.A.) for each pupil and for the class.
4. The C.A., M.A., and E.A. spread and median of the class.
5. The C.A., M.A., E.A., I.Q., E.Q., and A.Q. distributions of the class.
6. The scores as entered on the chart will present a scatter-diagram for C.A., M.A., E.A., I.Q., E.Q., and A.Q.

On the whole, the chart seems an excellent scheme for preserving the statistical data obtained from standardized tests in a diagnostic form which permits ready comparisons between classes or groups of classes. Its chief fault seems to be that the identity of individual scores is lost in transferring them to the chart by means of dots or check marks. If the chart could be used in such a way that all scores which fall outside a normal distribution in any respect could be traced back to the corresponding pupils its value would be greatly increased. If the number of scores to be recorded on a single chart were not too great, this difficulty might be met by having on the back of the chart a numbered list of the pupils' names and by entering in the appropriate square on the score sheet not a check mark or dot for each score, but the number of the pupil.

Educational Tests and Field Studies

In chapter VIII of *Education in Wisconsin*, the biennial report of the State Department of Public Instruction is given an interesting and optimistic account of the practical use of Standard Tests and Measurements in the schools of the state. The interest in the tests among teachers and supervisors is increasing, for they are coming to regard tests more and more as necessary tools of instruction and supervision. The following uses of them are mentioned: (1) for diagnostic purposes, (2) in remedial follow-up work, (3) in promoting economy of time and effort, (4) as an aid in determining the subject load, (5) in studying disciplinary cases, (6) in field research problems, and (7) in an unsuccessful attempt to find a means for the early elimination of the unfit in teacher-training institutions.

TABLE I. PERCENT OF NORMAL-SCHOOL SENIORS WHOSE SCORES ON CERTAIN ACHIEVEMENT TESTS WERE BELOW EIGHTH-GRADE STANDARDS

Subject	Per-cent	No. Tested
Elementary geography	42	590
Arithmetic problems	40	530
Composition	4	336
Grammatical correctness	11	435
Sentence recognition	37	389

The report also contains another study of the variability of teachers' marks in the grading of composition papers. A particularly interesting feature is a table showing the results of an attempt "to find whether or not pros-

pective teachers (normal-school Seniors) know what they are preparing to teach." Certain achievement tests were given to senior students in the normal schools and the results compared with the eighth-grade standards are given in Table I.

As the report says, "Conditions are surely bad when in one school 82 percent of the prospective teachers in the senior class have less knowledge of elementary geography than their pupils should have." About fifteen pages are devoted to tables giving a summary of test results obtained from 1922 to 1924; a remedial program is presented in the last five pages.

A Note on the Utility of Certain Fractions

A rather pronounced tendency has begun toward the elimination of a great deal of subject-matter in arithmetic, much of which has been included in textbooks and courses of study for a long time. Doubtless most of this elimination is justifiable, and it may be that much more can be eliminated without seriously endangering the child's chances for success in life. Care should be exercised, however, that the eliminations, now that the movement is in full swing, do not proceed on such a wholesale basis as to leave out the factor of scientific determination of social utility.

One of the fields where elimination has taken place is in the field of fractions. A great deal of controversy has raged about the point of the utility of certain denominators. The following data are submitted as having a bearing on this point. The items given in Table I are items taken from the sales slips of a large department store in Sioux City, Iowa, during a single month.

TABLE I. ITEMS FROM SALES SLIPS OF A DEPARTMENT STORE

Slip Number	Date	Amount of Article	Unit-Price	Amount
10166–15	3/ 1/24	1/7 yd. crepe	$1.98	$0.29
10166–44	3/ 4/24	1/7 yd. velveteen	2.98	.45 (sic
7577–10	3/ 5/24	1/7 yd. silk	2.98	.43
7719–37	3/ 8/24	1 1/5 yd. muslin	.25	.30
6594–30	3/10/24	1/5 yd. satin	2.50	.50
9183–19	3/12/24	5/9 yd. braid	2.00	1.11
5604–48	3/21/24	1/9 yd. velvet	4.98	.55
8468–9	3/28/24	1/5 yd. taffeta	5.00	1.00

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